ORDER NO. VSD9406M635

Service Manual

Time Lapse Recorder

Panasonic VHS PAL

AG-6124-E -B

K-MECHANISM

Sec. 1 *Operating Instructions*

Sec. 2 *Disassembly Procedures*

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Sec. 5 *Block Diagrams*

Sec. 6 *Schematic Diagram & Circuit Board Diagrams*

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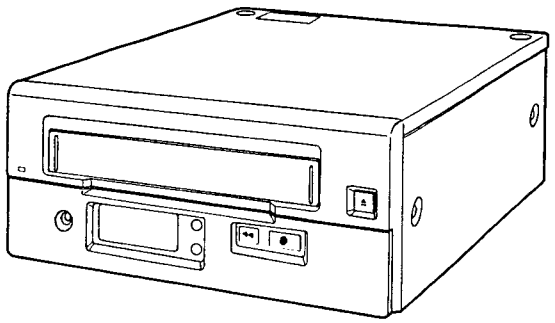

Please use this manual together with the service manual for K-MECHANISM, Order No. VSD9402M632.

SPECIFICATIONS

ITEM	SPECIFICATIONS	ITEM	SPECIFICATIONS
Power	Source: 220V~ 240V AC 50~ 60Hz Consumption: Approx. 18 Watts	Television System	CCIR Standard (625 lines, 50 fields) PAL Colour Signal
Video	Head: 4 rotary heads, helical scanning system Luminance: FM recording Colour signal: Converted subcarrier phase shift recording Input Level: VIDEO IN (BNC); 1.0Vp-p, 75Ω Output Level: VIDEO OUT (BNC); 1.0Vp-p, 75Ω Signal-to-noide Ratio: 46dB (coluor/ B/ W 3-hour mode) Horizontal Resolution: 240 lines (color mode) 320 lines (B/ W)	Tape Speed	3-hours mode: 23.39mm/ s 6-hours mode: 11.69mm/ s 12-hours mode: 4.678mm/ s 24-hours mode: 2.599mm/ s Recording Time Mode: 3/ 6/ 12/ 24 hours FF/ REW Time: Approx. 3min. with NV-T120
		Tape Format	Tape width 1/ 2" (12.7mm) high density VHS tape
Audio	Head: Audio/ Control: 1 stationary head Erase: 1 full track erase 1 Audio track erase Track: 1 track Input Level: LINE IN;(PHONO) −10dBv, 47kΩ unbalanced MIC IN;(3mm) − 60dBv,600Ω unbalanced Output Level: LINE OUT;(PHONO) −8dBv, 1kΩ unbalanced Frequency Responce: 50Hz~ 10kHz (3-hour mode) Signal-to-Noise Ratio: better than 42dB (3-hour mode)	Operating Condition	Temperature: 5℃ ~ 40℃ Humidity: 35% ~ 80%
		Dimension	270mm (W) × 344.5mm (D) × 120mm (H)
		Weight	5.0kg
		Optional Accessories	Wired remote controller: AG-A11

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

INTRODUCTION

This Service Manual contains the technical information which service personnel to understand and service the Panasonic VHS Time Lapse Recorder model AG-6124.
Please use the this service manual together with the Service Manual for mechanical adjustments and maintenance procedures of K-Mechanism (Order No. VSD9402M632).

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SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads connectors, control shafts,etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1M ohm and 5.2 M ohm.
   When the exposed metal does not have a return path to the chassis, the reading must be ∞.

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5k ohm, 10 watts resistor, in parallel with a 0.15uF capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

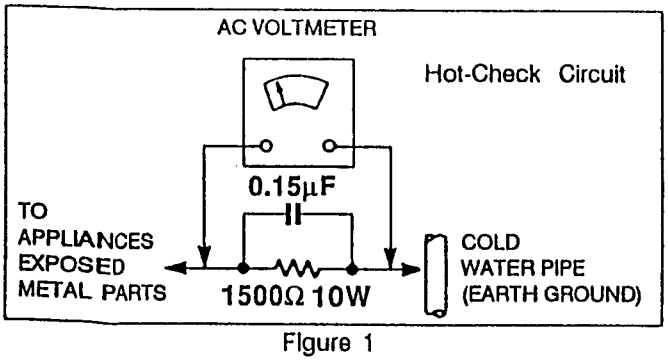


Figure 1

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.
   Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as anti-static can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package untilimmediately before you are ready to install it. (Most replacementES devices are packaged with leads eletcrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION : Be sure no power is applied to the chassis or circuit, and observe all otner asfety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

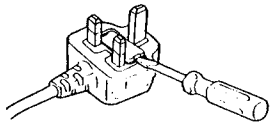
Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

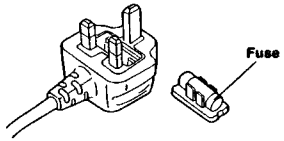
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.
- Under no circumstances should either of these wires be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚ .

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



is the safety information.

Lithium Battery

Warning
The lithium battery in this equipment must only be replaced by qualified personnel. When necessary, contact your local Panasonic supplier.

"The lithium battery is a critical component (type number VL2330/1HF manufactured by Panasonic.)

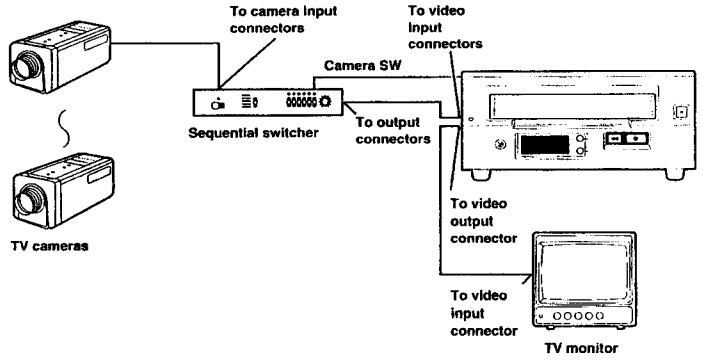
It must never be subjected to excessive heat or discharge. It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacturer. They must be fitted in the same manner and location as the original battery, with the correct polarity connections observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose. It should be disposed of in waste products destined for burial rather than incineration."

Example of VTR Monitoring/Observation System

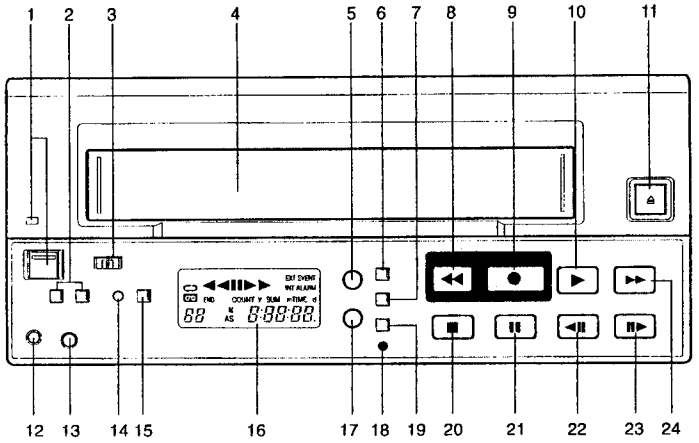
Example of system using a sequential switcher



- Video cameras equipped with a gen-lock synchronizing capability are recommended for a system configured with a sequential switcher.

Do not supply the signals of a colour camera and black-and-white camera simultaneously to the camera input connectors. This may cause sync fluctuations on the monitor screen or generate noise.

Parts And Their Functions



❶ **VTR switch/STANDBY lamp**
The power is tuned on when this switch is pressed, and lamp goes off. When the switch is pressed again, the power is turned off and the lamp lights.

❷ **Tracking (–, +) buttons**
These buttons are used to adjust the tracking. If noise appears on the playback picture, press the buttons to adjust the tracking is such a way that the picture is made as clear as possible. When both buttons are pressed together, the tracking is adjusted automatically.

❸ **MENU/REC LOCK switch**
When this switch is set to REC LOCK, the time mode and operation buttons as well as the power switch cannot be operated while recording is in progress.
When it is set to MENU, the menu screen appears.

❹ **Cassette holder**
This is the loading slot for the video cassette.

❺ **REC display lamp**
This lamp lights while recording is in progress. It goes off when recording is reset.

❻ **RESET button**
When this button is pressed, the counter display is reset to 0:00:00.

For Swedish and Danish Customers

- Aven om denna omkopplare är i "OFF"-läge, gar fortfarande en del av apparaten nätspänning.
- Selv om denne omskifter er i "OFF" stilling, tiløres en del af apparatet stadig strøm.

❼ **COUNTER/SEARCH selector button**
When this button is pressed, the display on the display panel changes to time, counter, counter memory and alarm search.
The "M" mark appears on the display panel in the counter memory mode. When the tape is fast forwarded or rewound in this mode, the counter will automatically stop when 0:00:00 is approached. The "AS" mark appears on the display panel in the alarm search mode. When the tape is fast forwarded or rewound in this mode, the unit is automatically set to still-picture playback at the alarm recording section.

❽ **REW button**
When this button is pressed, the tape is rewound. When it is kept depressed during playback, the review mode is established. When the button is pressed during recording, the tape runs temporarily in the reverse direction, and after the recorded section has been played back, the unit is returned to the recording mode.

❾ **REC button**
Recording starts when this button is pressed.

❿ **PLAY (page) button**
Playback starts when this button is pressed. The pages on the menu screen are advanced when the button is pressed while a menu screen is displayed.

⓫ **EJECT button**
This is used to eject the video cassette.

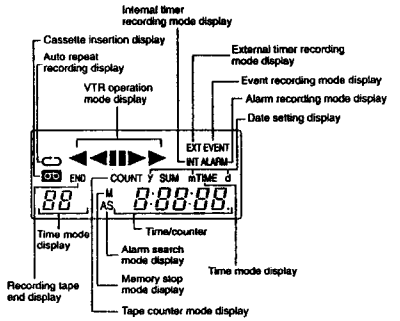
⑰ REMOTE control connector
For connecting the AG-A11 remote controller which is available as an optional accessory.

⑱ MIC input jack
Input jack (3 mm) for an external microphone. This jack has precedence when signals are supplied simultaneously to this jack and the audio input connectors.

⑯ INT TIMER display lamp
This lights when internal timer recording has been set.

⑮ TIMER MODE (REC MODE) button
This is the operation button for internal timer recording or external timer recording. The displays shown below light on the display panel.
INT: At the times set by the internal timer, the power is automatically turned on or off and recording starts or stops.
No display: When timer recording is not performed.
EXT: When the external power is turned on, recording starts automatically.

⑭ Display panel



- Operation mode displays

Operation mode	Display
Playback	▶
Recording	▶ REC lamp lights.
Still picture	▮▮
Recording pause	▮▮ REC lamp lights.
Recording check	▶ REC lamp lights.
Fast forwarding	▶▶
Rewinding	◀◀
Cue	▶▶
Review	◀◀
Forward field advance	▮▮
Reverse field advance	▮▮

- Error messages
An error code appears when trouble has occurred during operation.
E-2: Trouble in video cassette insertion area
E-3: Trouble in video cassette tape loading area
E-4: Trouble in cylinder area
E-5: Trouble in tape transport area
d: Formation of condensation (dew)

⑰ ALARM display lamp
This remains lighted while alarm recording is in progress. It flashes when alarm recording ends.

⑱ SUMMER TIME button
This is used to switch between the present time and summer (daylight saving) time.

⑲ TIME MODE button
This is used to select the recording and playback time mode. Each time this is pressed, the time mode changes in the following sequence:

→ 3 → 6 → 12→ 24 ┐

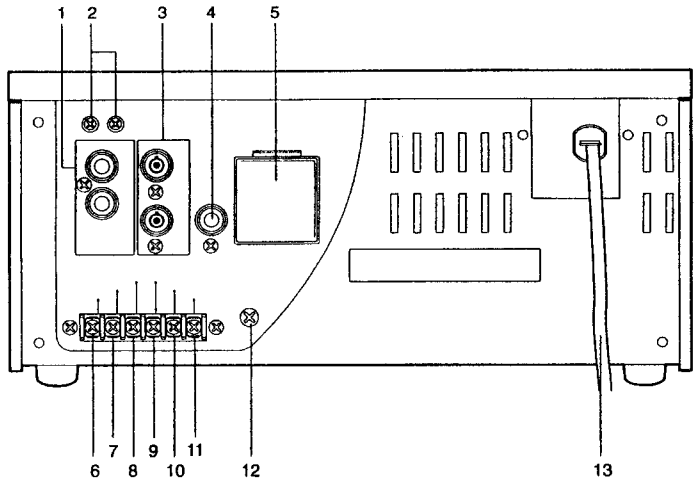
㉓ STOP (shift) button
When this is pressed, the tape stops traveling. When it is pressed while a menu screen is displayed, the setting items move downward.

㉑ PAUSE/STILL (shift) button
When this is pressed during recording, the tape temporarily stops traveling. When pressed during playback, the tape temporarily stops traveling, and a still picture appears on the TV monitor. When pressed again, the tape travel resumes.
When it is pressed while a menu screen is displayed, the setting items move toward the right.

㉒ Field REV ADV (set) button
When this is kept depressed during still-picture playback, the picture is advanced field by field in the reverse direction. When it is released, the still picture reappears. When a menu screen is displayed, it is used to change an item (decrement a value).

㉓ Field FWD ADV (set) button
When this is kept depressed during still-picture playback, the picture is advanced field by field in the forward direction. When it is released, the still picture reappears. When a menu screen is displayed, it is used to change an item (increment a value).

㉔ FF button
When this is pressed, the tape is fast forwarded. When it is kept depressed during playback, the unit is placed in the cue mode.



❶ Audio input/output connectors
Audio input/output connectors (phono jacks)

❷ Vertical hold controls (3h, 6h)
When the image on the TV monitor runs vertically during still-picture playback, adjust these controls by turning them with a small screwdriver.

❸ Video input/output connectors
Video input/output connectors (BNC); connect the input connector to the video camera, etc. and the output connector to the TV monitor, etc.

❹ Camera switching output connector
Camera switching output connector; connect it to the sequential switcher.

❺ Battery installation area
Install the battery in this area. See "Lithium Battery" on page 3.

❻ Alarm input connector
Alarm recording input connector; connect it to the external sensor.

❼ Ground terminal

❽ Alarm reset connector
Input connector for releasing alarm recording; a +4 to +14V DC voltage is required.

❾ SUMMER TIME connector
This is used to switch between the present time and summer time. (See page 14.)

❿ Tape end output connector
When the cassette tape comes to its end during recording, the alarm device installed externally is activated.

⓫ Auto off output connector
When trouble has occurred in the unit, the alarm device installed externally is activated.

⓬ Ground terminal

⓭ Power cable

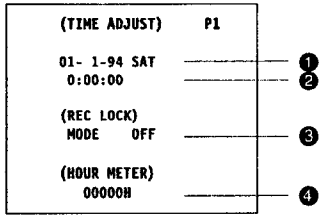
Menu Screens

One of the menu screens appears on the TV monitor when the MENU/REC LOCK switch is set to MENU. The display returns to the regular screen when this switch is set to OFF.

- When a menu screen has appeared, the items are set using the page, shift and set buttons.
- Advance through the pages ("page up") of the menu screen using the page button.
- Move the items (downward or toward the right) using the shift button.
- Change the items (increment or decrement the values) using the set button.

MENU SCREEN 1

In addition to the date and time display and the recording mode lock setting which appear on the TV monitor, the hour meter is displayed on Menu Screen 1.



❶ **Date setting (see page 12)**

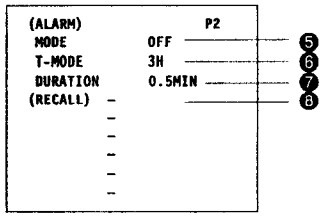
❷ **Time setting (see page 12)**

❸ **Recording mode lock**

❹ **Hour meter (see page 18)**
This indicates the unit's total operation time (the cumulative total for the cylinder rotation time).

MENU SCREEN 2

The alarm recording mode is set on Menu Screen 2.



❺ **Alarm recording mode selection (see page 26)**
The recording mode in the event of an alarm input is selected. (OFF → ALARM → EVENT)

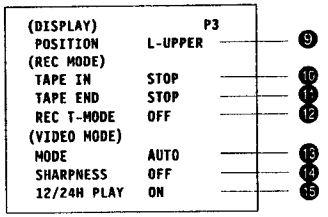
❻ **Alarm recording time mode selection**
When there is an alarm input during recording in the time lapse mode, the recording time mode is switched to the designated mode, and the details of the alarm status are recorded faithfully. (3H/6H)

❼ **Alarm recording duration setting**
This sets the time elapsing from the start of alarm recording until its end. This time can be set in 30-second increments from 0.5 to 3 minutes. (0.5 → 1.0 → 1.5 → 2.0 → 2.5 → 3 → CONTINUE → MANUAL)
CONTINUE: Alarm recording continues until the tape end.
MANUAL: Alarm recording is performed while the alarm input continues.

❽ **Alarm recall (see page 28)**
This checks the input times (up to 6) of the alarm signals.

MENU SCREEN 3

The position of the display on the TV monitor and VTR modes are selected on Menu Screen 3.



❾ **Display position selection (see page 15)**
This selects the position of the date/time display on the TV monitor. (L-UPPER → R-UPPER → L-BOTTOM → R-BOTTOM → CENTRE→ OFF)

❿ **Selection of VTR operation when cassette is inserted**
STOP: Stop mode
REC: Simply by inserting the cassette tape, recording is started automatically.
REW → REC: When the cassette is inserted, it is first rewound to the start of the tape and then recording is started automatically.

⓫ **Selection of operation when tape end is detected during recording (see page 24)**
STOP: Stop mode
REW: The tape is automatically rewound to the start where it stops.
REPEAT: The tape is automatically rewound to the start, and recording is repeated.

⓬ **Recording time mode selection**
When recording starts, the set time mode is always established. (OFF → 3H → 6H →12H → 24H)
OFF: Any time mode can be set using the TIME MODE button on the front panel. It can be changed even while recording is in progress.

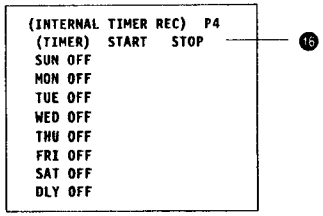
⓭ **Video signal mode**
This selects the operation of the colour/black-and-white automatic selector circuit.
AUTO: The circuit automatically identifies the type of video input or playback signals, and selects the colour or black-and-white mode accordingly.
B/W: The black-and-white mode is forcibly established.

⓮ **Playback picture quality selection**
The outlines of the playback images can be emphasized.
OFF: Regular mode
ON: The playback picture has emphasized outlines.

⓯ **12-/24-hour time mode playback system**
This selects the system in which a tape is to be played back in the time lapse mode. It is set to ON for playing back a tape which was recorded in the 12-/24-hour time mode.

MENU SCREEN 4

The internal timer recording modes are set on Menu Screen 4.



⓰ **Internal timer recording mode setting (see page 19)**
This sets the weekly timer or daily timer recording mode. (OFF/ON)
OFF: Internal timer recording is not set.
ON: Internal timer recording is set. (The start and stop times are set.)

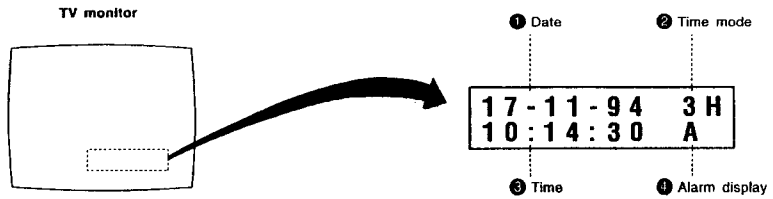
Note: Internal timer recording does not operate when the date and time have not been set.

CAUTION:

- The menu screens are not displayed while the unit is playing back a tape.

Date and Time Settings

This unit comes with a time/date generator which enables the date and time to be superimposed on the recording. When the power is switched on, the date, time of the day and time mode are displayed (in the case of a regular screen).



❶ **Date:**
The date appears as day/month/year.
❷ **Time mode:**
This is set by pressing the TIME MODE button. It flashes unless recording is in progress.
❸ **Time:**
The 24-hour system is used.
❹ **Alarm display:**
This appears during alarm recording.

Step	Operation	Monitor display	Display area
	Example: Setting the date and time to Friday, February 17, 1995 at 3:25. The time mode is set to 24 hours.		
1	Set the MENU/REC LOCK switch to MENU. Menu Screen 1 appears, and the year digits flash. OFF MENU ▯ REC LOCK ⇦	Menu Screen 1 (TIME ADJUST) P1 01- 1-94 SAT 0:00:00	y m d 94:01:01
2	Press the SET (+, –) buttons to set the year to "95." – SET +	(TIME ADJUST) P1 01- 1-95 SUN 0:00:00	y m d 95:01:01
3	When the shift (>) button is pressed, the month digits flash. Press the SET (+, –) buttons to set the month to "2." PAUSE/STILL REV FWD > – SET +	(TIME ADJUST) P1 01- 2-95 WED 0:00:00	y m d 95:02:01

Step	Operation	Monitor display	Display area
4	When the shift (>) button is pressed, the day digits flash. Press the SET (+, –) buttons to set the day to"17". > – SET + • The year can be set from 1994 to 2009.	(TIME ADJUST) P1 17- 2-95 FRI 0:00:00	y m d 95:02:17
5	When the shift (V) button is pressed, the hour digits flash. Press the SET (+, –) buttons to set the hour to "3." V – SET +	(TIME ADJUST) P1 17- 2-95 FRI 3:00:00	TIME 3:00.
6	When the shift (>) button is pressed, minute digits flash. Press the SET (+, –) buttons to set the minutes to "25." > – SET +	(TIME ADJUST) P1 17- 2-95 FRI 3:25:00	TIME 3:25
7	When the MENU/REC LOCK switch is set to OFF, the clock automatically starts running from time and date set. OFF MENU ▯ REC LOCK For the seconds, "00" is set. Even when the switch is set to MENU, the time will keep advancing if it has not been changed.	(TIME ADJUST) P1 17- 2-95 FRI 3:25:00	TIME 3:25.

- To clear the date and time display, set POSITION under (DISPLAY) on Menu Screen 3 to OFF.
- Even if the power should fail for a period of up to one week, the date, time and other display (internal timer setting, alarm recall) data is stored in the memory (but only if power has been supplied continuously to the unit for 3 or more days). When the unit has just been purchased or when it has not been used for along time, the data is not stored in the memory and the display shown below appears.

(TIME ADJUST) P1
01- 1-94 SAT
0:00:00

All the internal timer settings are set to OFF, and the alarm recall display is cleared.

- For the date setting, the unit automatically adjusts for leap years.
- Due to temperature fluctuations and other factors, the clock time may run fast or slow with a monthly error of up to ±60 seconds. This is not indicative of malfunctioning. Reset the time at regular intervals.

Summer time setting

When the SUMMER TIME button is pressed with a small screwdriver, the time is automatically advanced by one hour, and at the same time "SUM" appears on the display. When the button is pressed again, the time returns to its original setting, and at the same time "SUM" disappears from the display.

- The above settings can also be performed at the SUMMER TIME connector on the rear panel.

- The following phenomenon occurs when the date and time are set with the summer time setting.

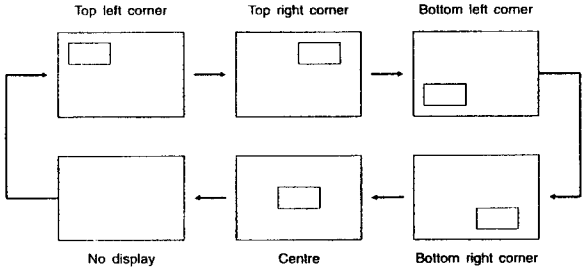
  <Example> 31 - 12 - 1995 (SUN) 23:22:00

  When the "hour" has been changed, be absolutely sure to check that the date is correct.

"Hour" setting	Date	Example
23 → 0	Moved up by 1 day	1 - 1 - 1996 (MON) 0:22:00
0 → 1	Moved down by 1 day	31 - 12 - 1995 (SUN) 1: 22:00
1 → 0	Moved up by 1 day	1 - 1 - 1996 (MON) 0:22:00
0 → 23	Moved down by 1 day	31 - 12 - 1995 (SUN) 23:22:00

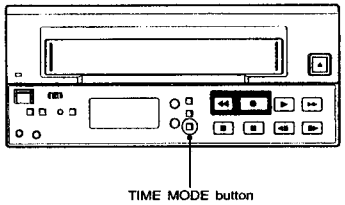
Time/Date Display Position

The position of the date and time displays on the TV monitor changes as shown below when (DISPLAY) on Menu Screen 3 is changed.



Step	Settings and operation	TV monitor display
1	Set the MENU/REC LOCK switch to MENU to display to menu screens. Press the page button to display Menu Screen 3 on the TV monitor. OFF MENU REC LOCK PLAY PAGE	Menu Screen 3 (DISPLAY) P3 POSITION L-UPPER (REC MODE) TAPE IN STOP TAPE END STOP REC T-MODE OFF (VIDEO MODE) MODE AUTO
2	Press the set (+, –) buttons to position the display as desired. REV ADV FWD ADV – SET +	(DISPLAY) P3 POSITION L-BOTTOM (REC MODE) TAPE IN STOP REPEAT REC ON REC T-MODE OFF
3	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored, and the date and time appear at the selected position. OFF MENU REC LOCK	25- 6-94 24H 4:15:23

Time Mode Selection



Refer to the table given below to select the mode that suits the intended purpose of use.

Tape type / Mode	Recordable time (hours)				Video recording interval (sec.)	Sound recording	Camera switching interval (sec.)	Tape travel method
	NV-E180	NV-E120	NV-E90	NV-E60				
3 hours	3	2	1.5	1	1/50	Yes	0.04	Continuous travel at 23.39 mm/sec.
6 hours	6	4	3	2	1/50	Yes	0.04	Continuous travel at 11.69 mm/sec.
12 hours	12	8	6	4	0.1	Yes	0.1	Continuous travel at 4.678 mm/sec.
24 hours	24	16	12	8	0.18	Yes	0.18	Continuous travel at 2.599 mm/sec.

Notes on operation
- This unit is designed with the NV-E180 cassette tape as a reference.
- Depending on the type of video cassette used, the recordable time will differ.
- Sound can be recorded in all time modes.
- The 12- and 24-hour modes are time lapse modes. Pictures are recorded with frames skipped to enable lengthy recording and playback.
- A tape recorded in a time lapse (12-/24-hour) mode can be played back in quick motion in the 3-hour mode.
- A tape recorded in the 3-hour mode can be played back in slow motion using the time lapse (12-/24-hour) mode.
- A tape recorded in the 6-hour (or 3-hour) mode cannot be played back in the 3-hour (or 6-hour) mode.
- When a tape recorded on the 6-hour mode is played back in another mode, colour programme is played back in black and white, but this is not a malfunction.

Selecting the cassette tape
The unit is designed as a product required to exhibit high reliability in surveillance, security, monitoring, etc. In order to maintain its recording reliability, it is recommended that the Panasonic video tapes listed below be used.

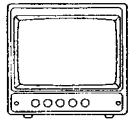
<VHS tapes>
- NV-E180
- NV-E120
- NV-E90
- NV-E60

- Avoid using 240-minute tapes with this unit.

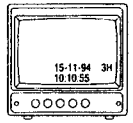
Recording Procedure

❶ Switch on the power to the connected equipment.

❷ Adjust so that the images of the video cameras appear properly on the TV monitor.



❸ Check that the date and time displayed on the TV monitor have been adjusted properly.



❹ Insert a cassette tape into the unit after checking that the tab on the cassette is intact.

❺ Set the timer recording, auto repeat recording, alarm recording, restoration-of-power-after-failure recording or other recording function.

❻ Select the time mode for the recording.

TIME MODE

❼ Press the REC button.

REC

Notes on operation
- If the PAUSE/STILL button is pressed during recording, the unit is set to the pause mode, and after about 5 minutes in this mode it is transferred to the stop mode.
- Neat frame-to-frame continuity is not achieved if the recording mode is set again after the PAUSE/STILL button is pressed during recording.
- When the MENU/REC LOCK switch has been set to OFF, other operations can be performed during recording.
- When restoration-of-power-after-failure recording is performed,recording can be continued in the same time mode even if the power should fail provided that the power is restored within about one week. (This applies only if the power has been supplied continuously for 3 or more days.)
- When performing auto repeat recording or timer recording, do not neglect to conduct the routine inspections.
- When recording images from a black-and-white camera, set the video signal mode on Menu Screen 3 to B/W.

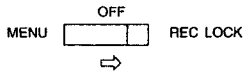
Tips For Better Recording

In order to ensure greater reliability in monitoring, surveillance and other continuous operations lasting many hours, this unit comes with some safety functions for recording. Read the following descriptions of these functions before proceeding to operate the unit.

Recording mode lock

There are two ways, as described below, to maintain the recording mode during recording by disabling the operations of the power switch as well as the TIME MODE and operation buttons.

❶ Set the MENU/REC LOCK switch to REC LOCK.



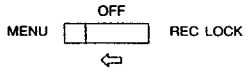
❷ Set REC LOCK on Menu Screen 1 to ON. (See Note)

The following switch and connectors are operational even if the MENU/REC LOCK switch is set to REC LOCK.

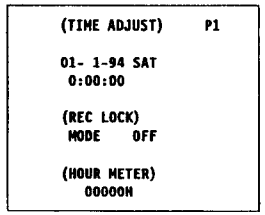
- Alarm input connector, alarm reset connector
- REC REVIEW

Hour Meter

By showing for how many hours the unit has been used, this meter provides useful information for regular inspection, maintenance and servicing involving the cleaning and replacement of the inside parts, etc. When the MENU/REC LOCK switch is set to MENU, the hour meter will appear on the TV monitor together with the date and time settings.



Menu Screen 1



The regular screen is restored when the MENU/REC LOCK switch is set to OFF.

Recording check

When the REW button is pressed during recording, the tape runs temporarily in the reverse direction, and the recorded section is played back. This function can be used to check the daily operation of the equipment in the system.

Restoration-of-power-after-failure recording

When a power failure has occurred during recording, the unit automatically starts recording if the power is restored within approximately one week.

- When the power fails, the tape "losing" safety protection function is activated to protect the video heads and video tape.

Before power is restored	After power is restored
• Stop, play, fast forward	Stop mode is established.
• Recording	Recording mode is established.
• Auto rewind • Auto rewind during auto repeat recording	Unit is returned to the mode applying before the power failed.

- If the power is restored more than one week after it failed, the unit is automatically set to the EXT REC mode and recording commences in the 24H mode. However, unless REC T-MODE on menu screen 3 has been set to OFF, recording will commence in the time mode set.

Note:
Once the recording mode is established, recording cannot be released until REC LOCK on Menu Screen 1 is set OFF.

Timer Recording

There are two methods of timer recording: one uses the internal timer and the other uses an external timer.

Internal timer recording

Start time and stop time

Bear in mind the following points when setting these times.

- **When the stop time is set later than the start time:**
  Example: 8:30 < 17:00
- **When the start time is set later than the stop time or the start time and stop time for weekly recording (weekly timer) are the same:**
  Recording starts at the start time on the day concerned and ends at the stop time on the following day.
  Example: 17:00 < 8:30
- **When the start time and stop time are the same:**
  Recording starts at 8:30 on the day concerned and ends at 8:30 on the following day.
  Example: 8:30 = 8:30
  To record for an entire day, set the start time and stop time to 00:00.

- Weekly recording (weekly timer) can be set by the day of the week.
- When (INTERNAL TIMER REC) on Menu Screen 4 is set to OFF for both the weekly timer and daily recording (daily timer), nothing appears for the start or stop time. Timer recording is considered not to be set.

Internal timer recording operation

Step	Operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Check that the TV monitor shows the correct present time.	25- 6-94 24H 4:13:08
3	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button so that the INTERNAL TIMER REC timer setting screen appears on the TV monitor. 	Menu Screen 4 (INTERNAL TIMER REC) P4 (TIMER) START STOP SUN OFF MON OFF TUE OFF WED OFF THU OFF FRI OFF SAT OFF DLY OFF

Step	Operation	TV monitor display
4	Set the operation times of the internal timer. • For details on the settings, refer to the sections on "Daily timer" or "Weekly timer." (See pages 21 to 22)	
5	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored. OFF MENU [ ] REC LOCK	25- 6-94 24H 4:15:23
6	Press the TIMER MODE (REC MODE) button so that INT lights on the display. (The internal timer lamp also lights.) TIMER MODE ⇨ INT Display When a cassette with a broken out tab has been inserted, the internal timer lamp flashes, and INT on the display also flashes. When the recording time arrives, nothing will be recorded.	

VTR operations after the settings

- The unit's power is turned off, and even if other buttons are pressed, their operations are not accepted.
- When the start time and stop time have not been set, INT flashes on the display.
- Even when the power should fail, the start and stop times set for timer recording are stored in the memory provided that the power is restored within a week or so (but only if power has been supplied continuously to the unit for 3 or more days).
- When the unit has just been purchased or when it has not been used for a long time, the start and stop times are not stored in the memory.

Releasing the internal timer mode

Press the TIMER MODE (REC MODE) button to clear INT on the display.

Note:
- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

Weekly Recording (Weekly Timer)/Daily Recording (Daily Timer)

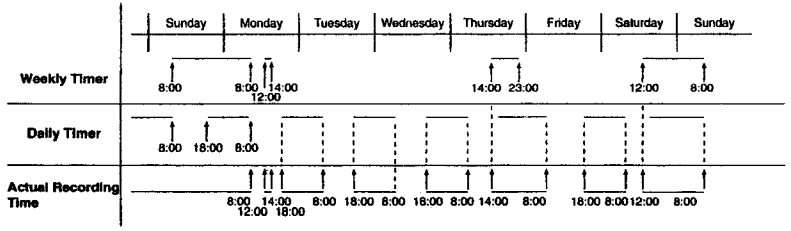
Step	Selection and operation When recording from 8:30 to 12:00 from Sunday through Thursday and from 9:00 to 12:00 on Fridays and Saturdays	TV monitor display
1	Check that OFF or ON for Sunday (SUN) is flashing. If the setting is OFF, press the set (+, –) buttons to display ON. REV ADV ◀◀ FWD ADV ▶▶ – SET +	Menu Screen 4 (INTERNAL TIMER REC) P4 (TIMER) START STOP SUN OFF MON OFF
2	When the shift (>) button is pressed, the setting moves to the start time and the "hour" digits flash. PAUSE/STILL ▮▮ >	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 0:00 0:00 MON OFF
3	Press the set (+, –) buttons to display "8." REV ADV ◀◀ FWD ADV ▶▶ – SET +	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:00 0:00 MON OFF
4	When the shift (>) button is pressed, the "minutes" digits flash. PAUSE/STILL ▮▮ >	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:00 0:00 MON OFF
5	Press the set (+, –) buttons to display "30." REV ADV ◀◀ FWD ADV ▶▶ – SET +	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:30 0:00 MON OFF
6	When the shift (>) button is pressed, the "hour" digits flash. PAUSE/STILL ▮▮ >	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:30 0:00 MON OFF
7	Press the set (+, –) buttons to display "12." REV ADV ◀◀ FWD ADV ▶▶ – SET +	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:30 12:00 MON OFF

Step	Selection and operation	
8	When the shift (>) button is pressed, the "minutes" digits flash. PAUSE/STILL ▮▮ >	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:30 12:00 MON OFF
9	Press the set (+, –) buttons to display "00." REV ADV FWD ADV ◀▮▮ ▮▮▶ – SET +	(INTERNAL TIMER REC) P4 (TIMER) START STOP SUN ON 8:30 12:00 MON OFF
10	Following the same procedure in steps 1 to 9, display the start time of "8:30" and stop time of "17:00" from Monday (MON) through Thursday (THU). Following the above procedure, set the times for Friday (FRI) and Saturday (SAT) as well. In this way, the timer operation times have been set for each day of the week. The settings for daily recording (daily timer) are also performed following the same steps 1 to 9.	

- When daily recording and recording by day of the week are to be conducted together, the timer recording operations will be as shown below when the time settings are as follows.

(INTERNAL TIMER REC) P4
(TIMER) START STOP
SUN ON 8:00 8:00
MON ON 12:00 14:00
TUE OFF
WED OFF
THU ON 14:00 23:00
FRI OFF
SAT ON 18:00 8:00
DLY ON 18:00 8:00

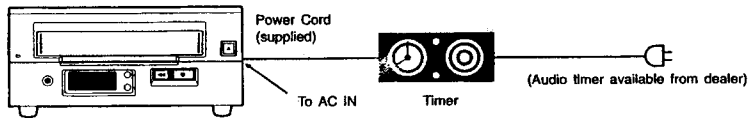
The setting shown on the screen at the left translates into the weekly and daily timer recording combinations shown below which, in turn, means that the actual recording time on the tape is shown at the bottom.



- The day of the week time settings are displayed, enabling the settings to be checked for each day of the week.
- Proceed with the setting with due consideration given to the total recording time since a 180-minute tape is long enough to provide recording for up to 24 hours only.

External Timer Recording

The unit can be made to record using an external timer to turn on its power.



External timer recording operations

Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Press the TIMER MODE (REC MODE) button so that EXT lights on the display. At the set time, power is supplied from the external timer and the unit is set to the recording mode. TIMER MODE ⇨ EXT Display	

- If the video cassette tape has not been inserted or if its accidental erasure prevention tab has been broken, EXT will flash on the display, and external timer recording cannot be conducted.
- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

Auto Repeat Recording/Auto Rewinding

Auto repeat recording: This function automatically rewinds the cassette tape when its end is detected in the recording mode, and it repeats recording from the start of the tape.
Auto rewinding: This function automatically rewinds the tape to the start when the tape end is detected in the recording mode.

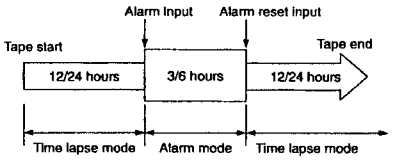
Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display Menu Screen 3 on the TV monitor. OFF MENU ▯▯ REC LOCK ▶ ⇦ PAGE	Menu Screen 3 (DISPLAY) P3 POSITION L-UPPER (REC MODE) TAPE IN STOP TAPE END STOP REC T-MODE OFF (VIDEO MODE) MODE AUTO SHARPNESS OFF 12/24H PLAY OFF
3	Press the shift (V) button to move the flashing to TAPE END. Press the set (+ or –) button to display REPEAT for auto repeat recording or REW for auto rewinding. STOP ■ REV ADV ◀◀ FWD ADV ▶▶ V – SET +	(DISPLAY) P3 POSITION L-UPPER (REC MODE) TAPE IN STOP TAPE END REPEAT REC T-MODE OFF
4	"↻" lights on the display. ↻ Display • If auto rewinding has been selected, "↻" is cleared.	
5	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored. OFF MENU ▯▯▯ REC LOCK ⇧	25- 6-94 24H 4:15:23

Notes of operation
- When auto repeat recording is to be performed, do not neglect the routine inspections. Since the image deteriorates when the same tape is used over and over again for auto repeat recording, replace the tape with a new one after about 50 recordings.
- Alarm signals are not accepted during auto rewinding, and so alarm recording is not performed.
- If an alarm signal is supplied during auto repeat recording, the alarm recording mode is established. If the tape then reaches its end, auto repeat recording is performed but alarm recording is released.

Alarm Recording (Emergency Recording)

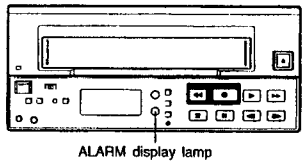
When an emergency occurs at the monitoring site during prolonged monitoring and recording, the alarm function is automatically triggered, and alarm recording is performed.

Principle of alarm recording

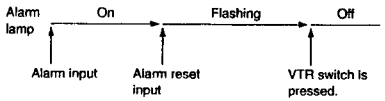


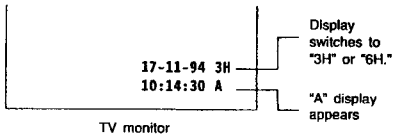
- When an alarm signal is supplied by an alarm sensor (door or intercom switch, etc.) during recording in a time lapse mode, the recording speed is switched to the 3- or 6-hour mode and the details of the state of emergency are faithfully recorded.

Alarm and display methods during alarm recording

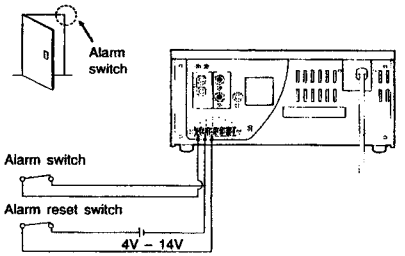


- When an alarm signal is supplied, the alarm display lamp functions as follows.



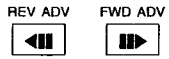


Connecting the alarm input connector



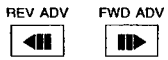
- Alarm recording starts when the alarm switch is set on. When the alarm reset switch is set ON after recording has started, alarm recording is released and operation is returned to the original time lapse recording mode.
- Alarm recording can be released by pressing the STOP button during alarm recording. However, it cannot be released even by pressing the STOP button if the MENU/REC LOCK switch is at REC LOCK or INT is lighted on the display.
- Alarm recording can be automatically reset without supplying the alarm reset input signal. The reset time can be set for 0.5, 1.0, 1.5, 2.0, 2.5 or 3.0 minutes.
- Another option is alarm recording only while the alarm input signal is supplied.
- Alarm recording is also possible as far as the end of the tape.

Alarm recording operation

Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 2) on the TV monitor. 	(ALARM) P2 MODE OFF T-MODE 3H DURATION 0.5MIN (RECALL) - - -
3	Press the set (+ or –) button to display ALARM for MODE. 	(ALARM) P2 MODE ALARM T-MODE 3H DURATION 0.5MIN (RECALL) - -
4	Press the shift (V) button to move the flashing to T-MODE. Press the set (+ or –) button to set the time mode. 	(ALARM) P2 MODE ALARM T-MODE 6H DURATION 0.5MIN (RECALL) - -
5	Press the shift (V) button to move the flashing to DURATION. Press the set (+ or –) button to set the recording duration. 	(ALARM) P2 MODE ALARM T-MODE 6H DURATION 0.5MIN (RECALL) - -
6	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.	25- 6-94 24H 4:15:23
7	Press the REC button. If an alarm input signal is subsequently supplied, the time mode set by T-MODE changes to 6H, and alarm recording continues until the alarm is released.	

- If TAPE END on Menu Screen 3 has been set to REPEAT, the auto repeat recording mode is established when the tape comes to the end.
- With emergency recording, set the unit to the POWER OFF or STOP mode.

Event Recording

Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 2) on the TV monitor. 	(ALARM) P2 MODE OFF T-MODE 3H DURATION 0.5MIN (RECALL) - - -
3	Press the set (+ or –) button to display EVENT for MODE. 	(ALARM) P2 MODE EVENT T-MODE 3H DURATION 0.5MIN (RECALL) - -
4	Press the shift (V) button to move the flashing to T-MODE, and press the set (+ or –) button to set the time mode. 	(ALARM) P2 MODE EVENT T-MODE 6H DURATION 0.5MIN (RECALL) - -
5	Press the shift (V) button to move the flashing to DURATION. Press the set (+ or –) button to set the recording duration. 	(ALARM) P2 MODE EVENT T-MODE 6H DURATION 0.5MIN (RECALL) - -
6	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.	
7	If an alarm input signal is subsequently supplied, the time mode set by T-MODE changes to 6H, and event recording continues until the alarm is released. When event recording is released, the REC/PAUSE mode is established and the next alarm input signal is awaited.	

- Depending on the time mode setting, the unit is repeatedly set to the recording (REC) and REC/PAUSE modes as shown in the table below.

Time mode	REC	REC/PAUSE
3H	6 sec	3 min
6H	6 sec	1 min
12H	45 sec	1 min
24H	45 sec	1 min

(Durations given are approximations.)

- Proceed with the settings on the menu in the STOP or EJECT mode.
- There is some disturbance in the pictures at the joins.

Alarm Recall

The time when the alarm signal was input can be ascertained on the TV monitor by checking the alarm input time in the RECALL item on Menu Screen 2.

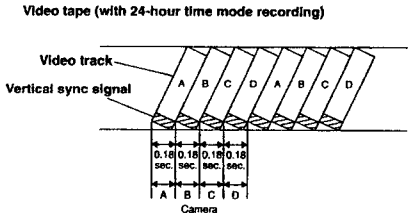
Step	Selection and operation	TV monitor display
1	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 2) on the TV monitor. OFF / PLAY MENU / REC LOCK ⇦ / PAGE	(ALARM) P2 MODE ALARM T-MODE 3H DURATION 0.5MIN (RECALL) 01-10-95 20:19 14-09-95 12:05 30-08-95 08:40 25-06-95 04:14 05-05-95 09:25
2	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.	19-12-95 24H 4:15:23

- The alarm recall function stores up to 6 alarm input times in the memory and displays them on the screen. If there have been more than 6 inputs, they will be deleted from the screen in sequence starting with the oldest data.
- When the RESET button is pressed while Menu Screen 2 is on the display, the alarm recall memory can be cleared.

Sequential Switcher Connection and Recording

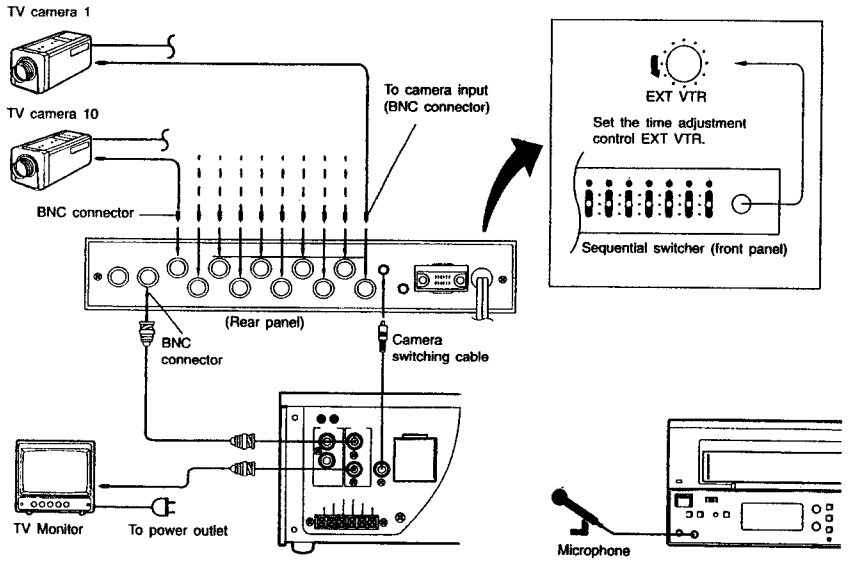
When a multiple number of cameras are used for recording, the timing at which the sequential switcher automatically switches the cameras can be controlled by this unit and the images of several cameras can be recorded.

Principle of camera switching



- In the 24-hour time mode, the cameras are switched automatically at the position of the vertical sync signal each time a video track is recorded.
- The camera switching interval differs according to the time mode. (See page 16)

Connections (using the WJ-523 sequential switcher)



Notes on operation

- If the sequential switcher is not provided with an EXT TIMING facility or when cameras are not going to be switched, adjust to a longer time than the video recording duration (see page 16) in the recording time mode.
- Synchronize the TV cameras for operation.

Playback Procedure

Before operating the unit, check that the internal/external timer recording displays (INT/EXT) have been cleared from the display. (If INT or EXT is displayed, use the TIMER MODE button to clear it.)

❶ Switch on the power to the unit and TV monitor.

❷ Insert the recorded cassette tape into the unit.

❸ Select the time mode.

TIME MODE

❹ Press the PLAY button.

PLAY

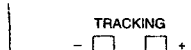
Notes on operation

1. Bear in mind the following points when playing back parts of a tape recorded in a time lapse (12-/24-hour) mode.
   - When the tape is played back in the same mode, noise resembling dropouts will appear on the screen: this is not indicative of malfunctioning.
   - The picture may oscillate in the vertical direction: this is not indicative of malfunctioning.
   - When a tape is played back in the same time mode, the picture may shake slightly sideways: this is not indicative of malfunctioning.
   - Dancing can be minimized when "12/24H PLAY" on Menu 3 is set to ON all the times.
2. Bear in mind the following points when playing back parts of a tape recorded in a VHS mode (3 or 6 hours).
   - Set "12/24H PLAY" on Menu Screen 3 to OFF at all times. If "12/24H PLAY" is set to OFF, picture oscillating can be alleviated by the TV monitor.
   - When a tape is played back in a time lapse mode, slight noise may appear at the top and bottom of the screen: this is not indicative of malfunctioning.
   - When a tape recorded on the 6-hour mode is played back in another mode, colour programme is played back in black and white, but this is not a malfunction.
3. When noise has occurred during still-picture playback, press the FWD ADV button to play it out.
4. Bear in mind that if the power cable is disconnected and then re-connected or if the power has been restored after it has failed when the tape was played with EXT indicated on the display by the TIMER MODE button, the unit will automatically be set from playback to the recording mode.
5. When the PAUSE/STILL button is pressed during playback, the unit is set to the pause mode, and a still picture will appear on the monitor screen. To release this state, press the PAUSE/STILL button again or press the PLAY button. If the unit is kept in the pause mode for more than 5 minutes, it will be set to the stop mode.
6. If the horizontal AFC on the TV monitor is too long or when a video camera with random interlace scanning has been used, the top area of the TV monitor may be distorted: this is not indicative of malfunctioning.

Tracking

When noise such as that shown below appears on the playback image in the 3- or 6-hour time mode, press the tracking (+ or –) button to minimize the noise.

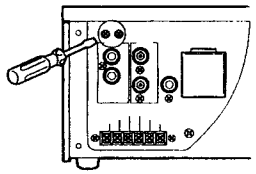
TRACKING



- For the tracking default setting, press the "+" and "–" buttons together (in the 3- or 6-hour time mode only).
- In the 12- or 24-hour mode, press the "+" or "–" button to adjust the tracking.

Vertical hold adjustment

If the image shakes slightly in the vertical direction during still-picture playback, use a screwdriver or some other implement to turn and adjust the vertical hold control on the rear panel. Do not touch it under normal circumstances.



- If the TV monitor has a vertical hold control, adjust that control also.

Routine & Regular Inspection Request

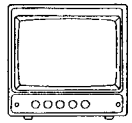
This unit is designed to withstand many hours of operation. Nevertheless, it is recommended that routine inspections be conducted to help ensure trouble-free operation.

CAUTION
Do not forget to conduct the routine inspection with auto repeat recording.

Routine inspection procedure

❶ Set the power switches on the unit, video cameras, TV monitor and other equipment connected in the monitoring system to the ON position.

❷ Is the picture on the TV monitor OK?



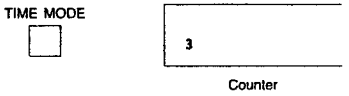
❸ Are the date and time displayed on the TV monitor correct?

❹ Rewind the cassette tape, which was recorded on the previous day, by an amount equivalent to a count on the counter or several figures.

REW

❺ Press the TIME MODE button to set to the mode to 3H (3 hours).

TIME MODE



❻ Press the PLAY button. The tape is played back by an amount equivalent to a count on the counter of several figures.

PLAY

❼ Is the playback image OK?

❽ Is there any problem with the recorded date and time?

❾ Press the REC button.

REC

❿ Check the playback images which were recorded in the 3-hour time mode.

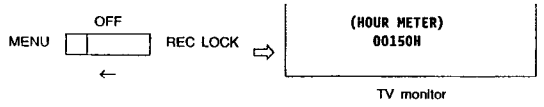
⓫ Upon completion of all the checks, set the unit to the desired mode.

Action taken after routine inspections

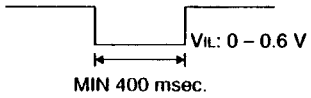
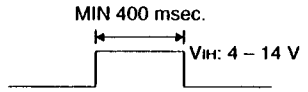
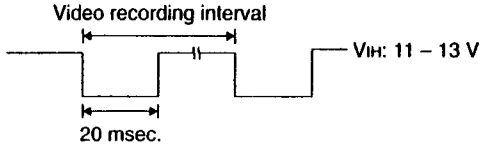
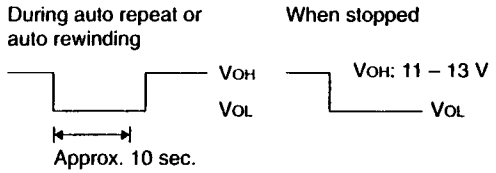
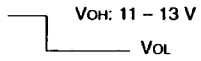
In the unlikely event of a problem with the unit, turn off the power, take hold of the power plug and disconnect it from the power outlet, and consult with the dealer from whom the unit was purchased.

Regular inspections recommended

This unit has an hour meter which shows for how many hours the VTR has been used. When the MENU/REC LOCK switch is set to MENU, Menu Screen 1 appears on the TV monitor, and the hour meter can be checked. Use the hour meter as a rough guideline to cleaning or replacing the parts inside the unit. For further details, consult with your dealer.



Input/Output Terminal Signal Level

Terminal	Signal Level	Note
Alarm Input/Summer Time Setting Input		LOW Input
Alarm Reset Input		HIGH Input
Camera Switching Output		V_{OH} = 11–13V (5.6kΩ) V_{OL} = 0–0.6V (max. 3 mA)
Tape end output		V_{OH} = 11–13V (4.7kΩ) V_{OL} = 0–0.6V (max. 3 mA)
Auto off output		V_{OH} = 11–13V (4.7kΩ) V_{OL} = 0–0.6V (max. 3 mA)

1-2. SERVICE INFORMATION

1-2-1. Emergency Cassette Removal

If the electrical circuit is defective and the action of unloading and front unloading do not work properly, it is possible to removing cassette manually.
There are 2 methods of removing the cassette.

A. Hand Operation

1. Remove the Bottom Plate.
2. Turn the worm gear to arrow mark direction by finger as shown in Fig.S1 until the loading post move to unloading position.
3. Turn the capstan rotor clockwise to take up the tape.
4. Turn the worm gear again to eject the cassette.

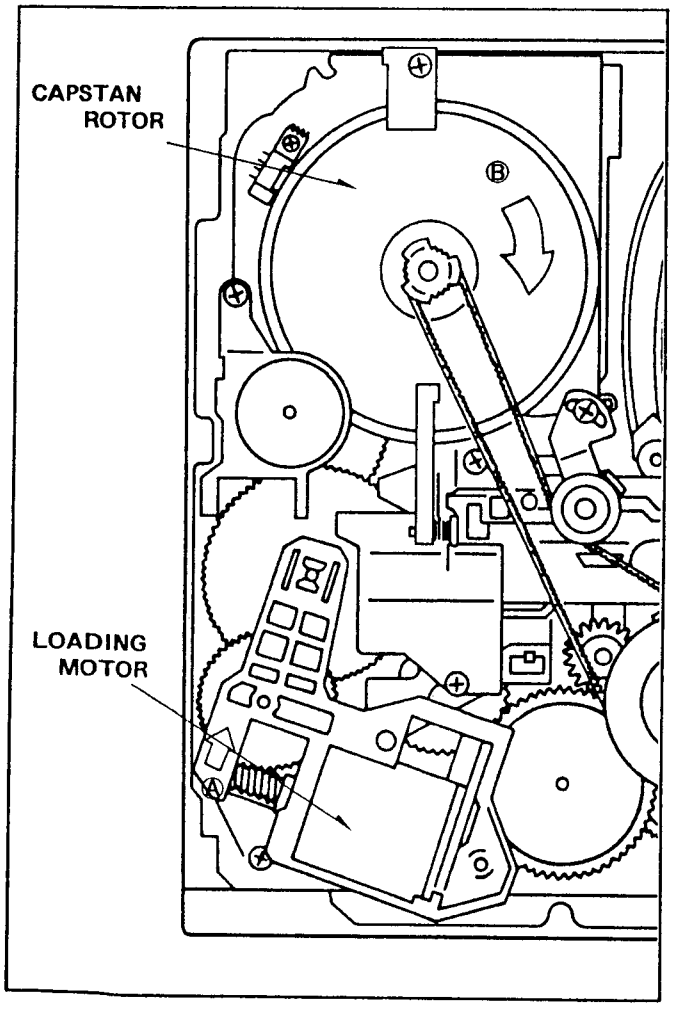


Fig. S1

B. Battery Operation

1. Remove the Bottom Plate.
2. Connect the battery (Manganese-Type (AA) 3pcs./+4.5V) to P1503 as shown in Fig.S2.
3. After moving the loading post to the unloaded position, disconnect the battery to stop the loading motor.
4. Turn the capstan rotor clockwise to take up the tape.
5. Reconnect the battery to eject the cassette.

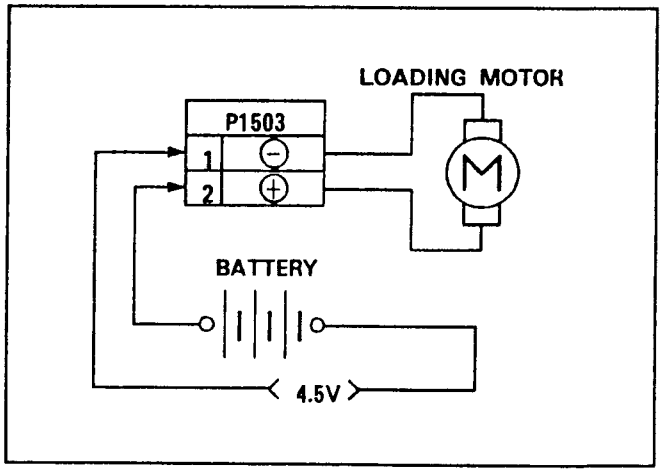


Fig. S2

1-2-2. Hour Meter Reset

1. Turn off by the power key.
2. Connect jumper wire between TP6104 and GND on the Main C.B.A.
3. Turn on unit by the power key whiles press the tracking "+" and "-" buttons simultaneously.
4. Flushing the all LCD display. (approx.4sec)
5. Hour meter reset when stop the LCD flushing.

1-2-3. Auto Off Operation & Error Code

ERROR CODE	CONTENS	CAUSE CONDITION
d	CONDENSATION (DEW)	1. If it is in POWER OFF mode,the mode turns to POWER ON and "d" indication. 2. If a tape is inserted,the mode turns to middle EJECT postion and the cylinder rotates. 3. Dew condensation continues for about 120 minutes. 4. After cancelleating condensation,if a tape is inserted,the mode turns to STOP.
E-2	FRONT LOADING LOCKED	1. If the motor is locked for about 2-5 seconds during front loading, the motor is unloaded. 2. If the motor is locked for about 2-5 seconds during front unloading, the motor is unloaded after loading. Then if it is locked for about 2-5 seconds, the mode turns to AUTO OFF and "E-2" indication.
E-3	LOADING LOCKED	1. If the mode is locked for about 5 seconds during loading, it is unloaded. Then if it is loaded and locked again, the mode turns to AUTO OFF and "E-3" indication. 2. If the motor is locked for about 2-5 seconds during unloading, the mode turns to AUTO OFF and "E-3" indication.
E-4	CYLINDER LOCKED	1. If the motor is locked for about 5 seconds in cylinder rotating mode, the mode turns to AUTO OFF and "E-4" indication.
E-5	REEL LOCKED	1. If the reel rotation is locked during tape running, the motor in unloaded once. Then if the rotation is locked through the trying to load, the mode turns to AUTO OFF and "E-5" indication.

DISASSEMBLY PROCEDURE

2-1. DISASSEMBLY FLOW CHART

This flow chart indicates disassembly steps of the cabinet parts and the circuit boards in order to find the necessary items for servicing. When reassembling, perform the steps in the reverse order.

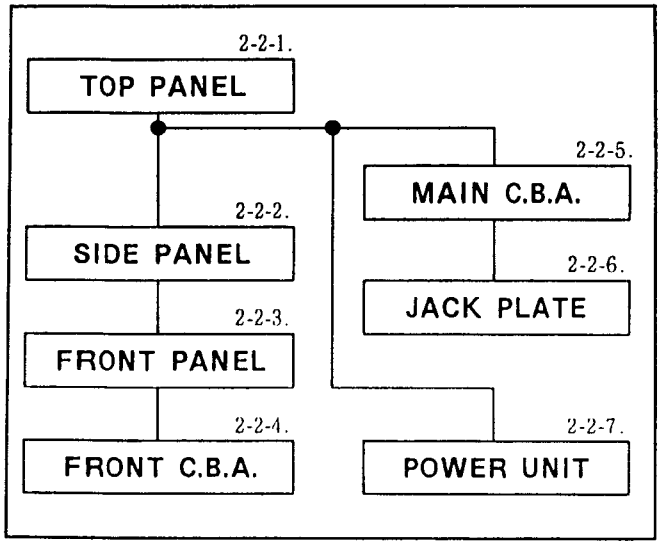


Fig. D1

2-2. DISASSEMBLY METHOD

2-2-1. Removal of the Top Panel

1. Unscrew the 2 screws (A) on the top of the unit and lift up rear portion of the Top Panel then slide it off the back of the unit.

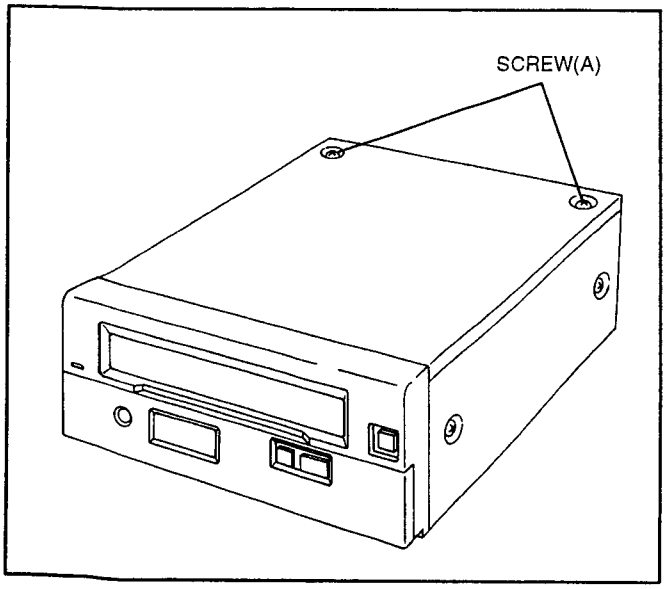


Fig. D2

2-2-2. Removal of the Side Panel

1. Unscrew 2 screws (B) on the side of the unit for each the Side Panel and remove the Side Panel.

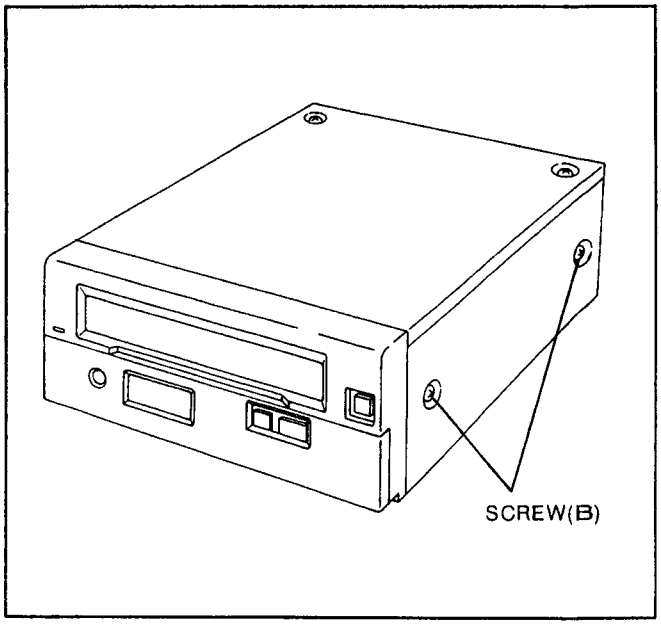


Fig. D3

2-2-3. Removal of Front Panel

1. Unlock the 4 locking tabs on the top and bottom of the Front Panel then pull the panel off the unit.

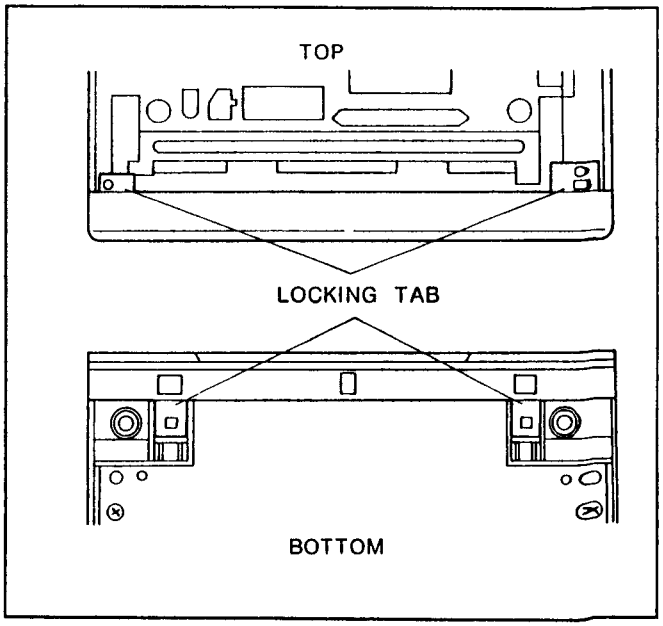


Fig. D4

2-2-4. Removal of the Front C.B.A.

1. Unscrew 2 screws (C), disconnect 2 flexible cables from the P6501 and P6502.
2. Unlock 6 locking tabs on the Front C.B.A.
3. Carefully pull the Front C.B.A. off the unit.

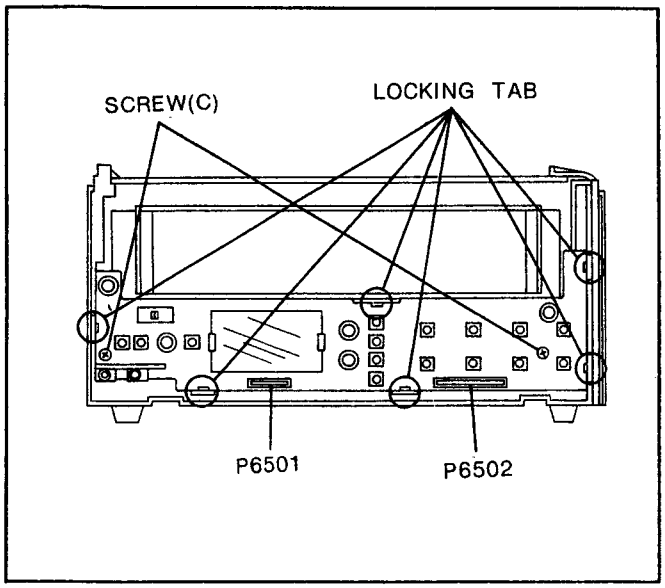


Fig. D5

2-2-5. Opening of the Main C.B.A.

1. Unscrew 3 screws (D) on the Main C.B.A.
2. Unlock 2 locking tabs and carefully open the Main C.B.A.

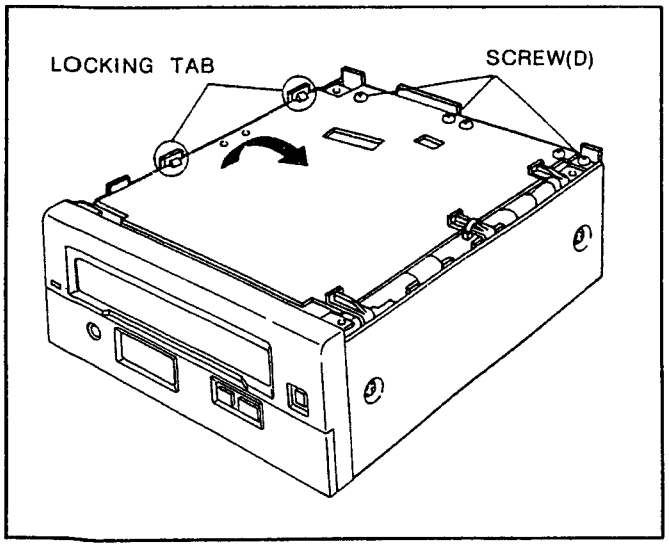


Fig. D6

2-2-6. Removal of the Jack Plate

1. Unscrew 2 screws (E) on the foil side of the Main C.B.A.
2. Carefully pull out the Rear Jack C.B.A. with the Rear Plate that connected the P6007 and P6008 on the Main C.B.A.

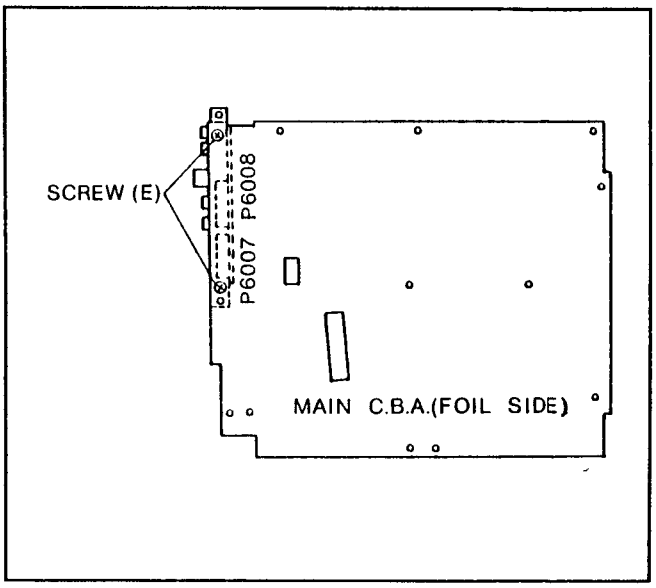


Fig. D7

2-2-7. Removal of the Power Supply Unit

1. Disconnect P1 connector in side of the Power Supply Unit.
2. Push down the locking tab and carefully slide the Power Supply Unit then lift it up from the unit.

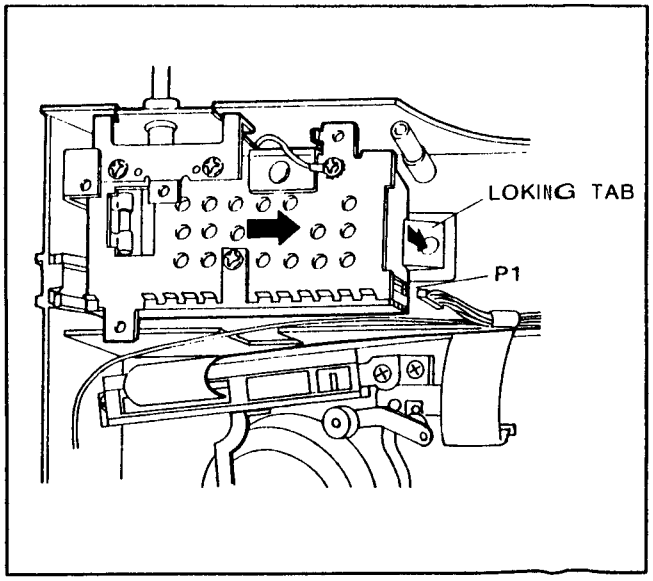
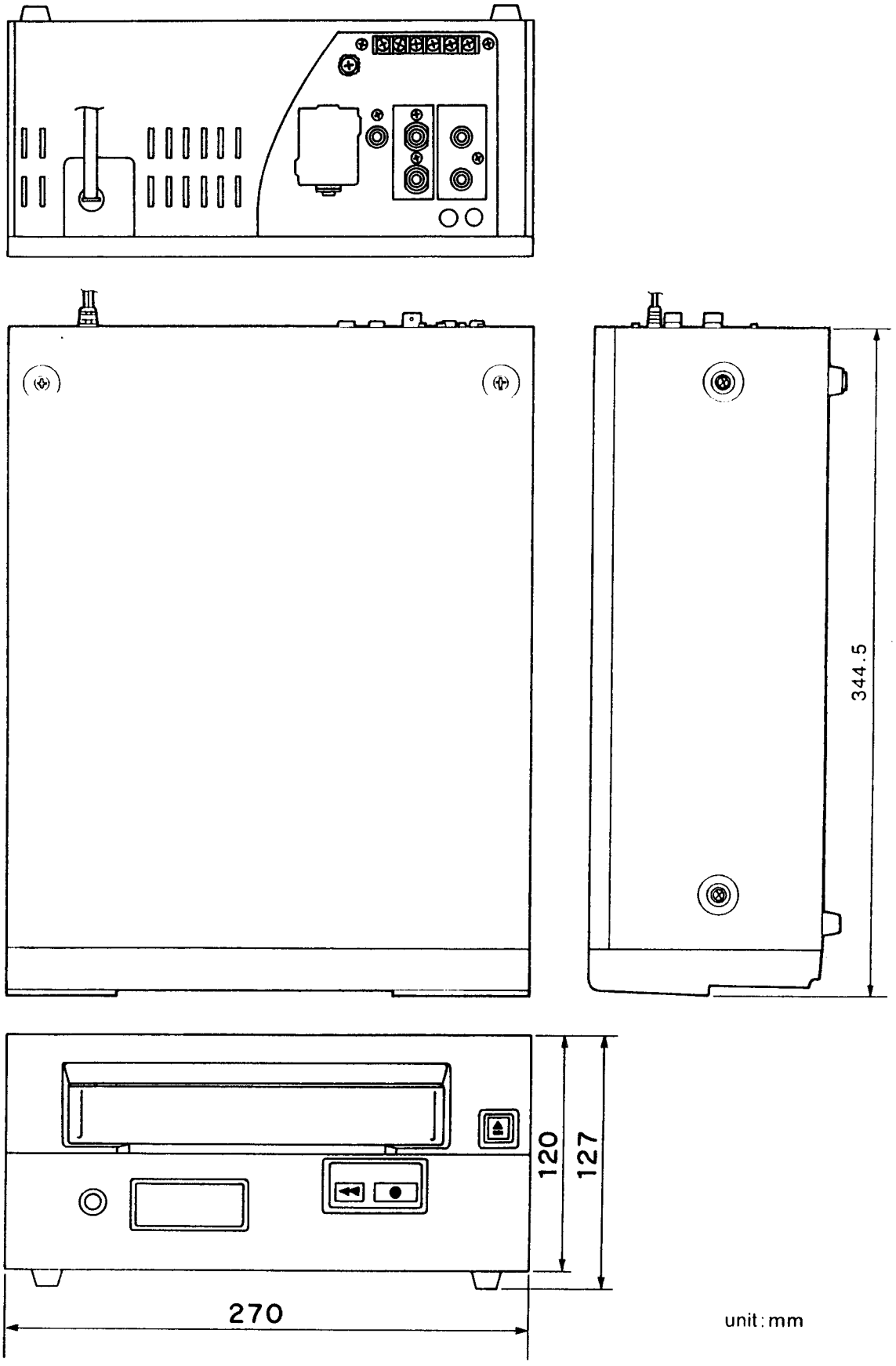


Fig. D8

DIMENSIONS



unit : mm

REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout its useful life. The user or service dealer should perform these maintenance regularly to ensure that maximum utility is obtained from the machine.

The VCR is a complicated place of equipment. It contains many belts, rollers, heads etc., which become worn, and deterlorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance be done according to the maintenance chart to maintain the functions of the VCR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

The VCR used for business applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, or poor environmental conditions may adversely affect the lifespan and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for his expenditure. Accordingly, the necessity of regular maintenance should be fully explained at the time of sale, as well as during after-sale repairs.

MAINTENANCE CHART

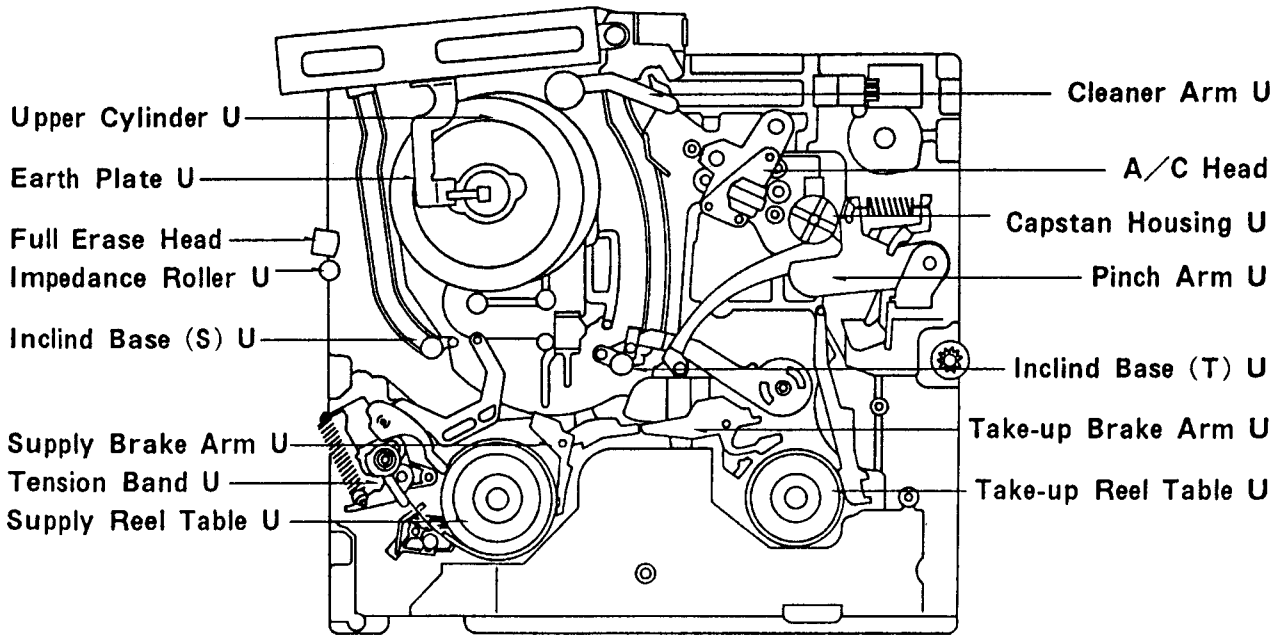
The following periodic maintenance is required to prolong the life of the machine.

Ref. No. IN P/L	Parts Name	Hour								Ref. No. IN P/L	Parts Name	Hour							
		500	1000	2000	3000	4000	5000	6000	10000			500	1000	2000	3000	4000	5000	6000	10000
—	Tape Transporter	●	●	●	●	●	●	●	●	52 (1)	Temsopm Band U						◎		◎
20 (1)	A/C Head	●	●	●	●	●	◎	●	◎	113 (2)	Timing Belt						◎		◎
71 (1)	Upper Cylinder	●	◎	◎	◎	◎	◎	◎	◎	62 (1)	Earth Plate U						◎		◎
70 (1)	Cylinder U	●	●	●	●	●	◎	●	◎	12 (1)	FE Head	●	●	●	●	●	●	●	◎
60 (1)	Supply Reel Table U	●	●	●	●△	●	●△	●	●△	127 (2)	Mode Switch						◎		◎
61 (1)	Takeup Reel Tuble U	●	●	●	●△	●	●△	●	●△	108 (2)	Main Cam Gear						×		×
106 (2)	Capstan Roter U	●	●	●	●	●	◎△	●	◎△	40 (1)	Inclined (S) U						▲		▲
105 (2)	Capstan Housing U						◎		◎	42 (1)	Inclined (T) U						▲		▲
49 (1)	Presure Rooer U			◎		◎		◎	◎	121 (2)	Loading Motor U						◎		◎
63 (1)	Supply Brake Arm U						◎		◎	9 (1)	Cleaner Arm U						◎		◎
15 (1)	Impedance Roller U	●	●	●	●	●	●	●	◎										
64 (1)	Takeup Brake Arm U						◎		◎	BAT6301	Backup Battery	Approx. 5 years							

*** NOTE:**

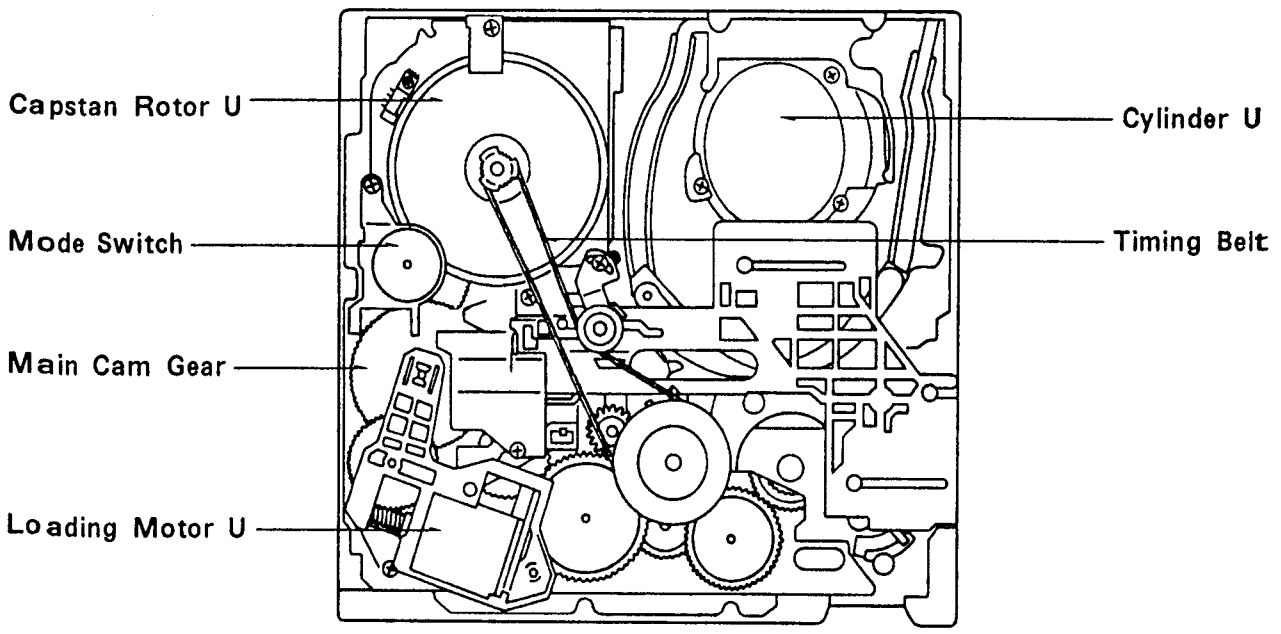
Symbol	Maintenance	Requirement	Remark
●	Cleaning	Ethyl-alcohol or Cleaning Liquid (Purchase locally)	Wipe dirt from the parts using soft cloth impregnated with Ethyl-Alcohol. Note: When cleaning rubber parts, avoid using excessive alcohol since it may accelerate deterioration of these parts. After cleaning with alcohol, wipe the alcohol quickly and thoroughly.
◎	Replacement	———	———
△	Lubrication	High Quality Spindle Oil (Purchase locally)	Supply one or two drops of oil.
▲	Greasing	Molytone Grease (MOR265)	Wipe the old grease and apply new grease.
×	Greasing	S.C.R. Grease (VFK0680)	Wipe the old grease and apply new grease.

3-2. PARTS LOCATION



TOP VIEW

BOTTOM VIEW



ELECTRICAL ADJUSTMENT PROCEDURES

4-1. TEST EQUIPMENT

To perform the electrical adjustment completely the following equipments are required.

1. VTVM (Vacuum Tube Volt Meter)
   Capacity: 0.001 to 50V
2. DVM (Digital Volt Meter)
   Capacity: 0.001 to 50V
3. Dual-Trace Oscilloscope (with probes)
   Capacity: 0.005 to 50V/div, DC to 30MHz
4. Frequency Counter
   Capacity: 0 to 10MHz
5. Sine Wave Signal Generator(RC Oscillator)
   Capacity: 0 to 10MHz
6. Video Signal Generator (Composite)
7. Spectrum analyzer
8. Color Monitor TV
9. Alignment Tape (VFM8080HQFP)

4-2. ELECTRICAL ADJUSTMENT PROCEDURES

HOW TO READ THE ADJUSTMENT PROCEDURE TABLE

BOARD	MAIN C.B.A.
TP	TP3502(F-2)
ADJ.	VR2002(A-3)
TAPE	ALIGNMENT TAPE
INPUT	COLOR BAR
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC.	T=6.5±0.5H

BOARD: Adjustment position of Print Circuit Board.
TP: Connection point(Test Point) of measuring equipment
* ( ) shown TP location on the board.
ADJ.: Adjustment component
* ( ) shown VR location the board.
TAPE: Tape for adjustment.
INPUT: Supply a signal for adjustment.
MODE: Mode of VTR.
Example:REC → PLAY is recording signal and playback the portion just recorded.
M.EQ: Measuring equipment.
SPEC.: Specification for adjustment.

4-2-1. PG SHIFTER ADJ.

BOARD	MAIN C.B.A.
TP	TP3502(F-3),TP6106(H-4)
ADJ.	VR2002(A-3)
TAPE	ALIGNMENT TAPE
INPUT	
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC.	T=6.5±0.5H

Note: *Tape interchangeability adjustment should be completed before this adjustment.*

1. Playback the 2nd portion of the alignment tape.
2. Connect the oscilloscope to TP3502 for CH1 and TP6106 for CH2.
3. Adjust VR2002 so that T=6.5 ± 0.5H as shown in Fig. E1.

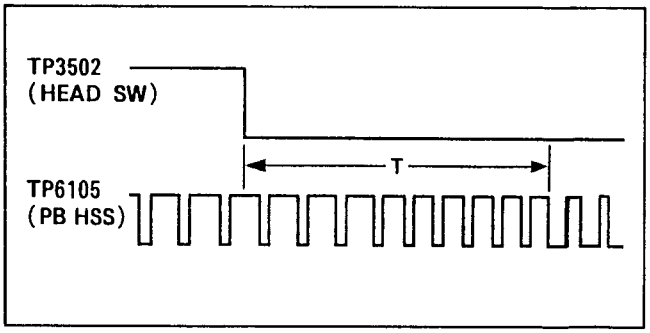


Fig.E1

4-2-2. SLOW FREE RUN ADJ.

BOARD	MAIN C.B.A.
TP	TP6004(A-4)
ADJ.	VR2001(A-3)
TAPE	
INPUT	
MODE	PLAY/PAUSE(STILL)
M.EQ	FREQUENCY COUNTER
SPEC.	F=470±10Hz

1. Connect the jumper wire between TP6002(B-8) and TP6003(B-8) on the MAIN C.B.A.
2. Playback the 2nd portion of the alignment tape.
3. Connect the low frequency counter to TP6004.
4. Adjust VR2001 so that F=470 ± 10Hz.
5. Remove a jumper wire when completed this adjustment.

4-2-3. SLOW TRACKING ADJ.

BOARD	MAIN C.B.A.
TP	VIDEO OUT
ADJ.	3H(FWD):VR2006(A-3) 3H(REV):VR2005(A-4) 6H(FWD):VR2004(B-4) 6H(REV):VR2003(B-3)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	REC → PLAY
M.EQ	MONITOR TV
SPEC.	NO NOISE BAR APPEAR ON THE MONITOR TV

Note: *SLOW FREE RUN adjustment should be completed before this adjustment.*

1. Record the colour bar signal a few minute in the 3H and 6H tape speed mode.
2. Set the tracking to fix position that press the tracking buttons (+)/(-) simultaneously.
3. Place the unit in SLOW mode at 3H recorded portion.
4. Adjust VR2005(REV) and VR2006(FWD) until noise bar disappear on the monitor screen.
5. Place the unit in SLOW mode at 6H recorded portion.
6. Adjust VR2003(REV) and VR2004(FWD) until noise bar disappear on the monitor screen.

4-2-4. V LOCK ADJ.

BOARD	MAIN C.B.A.
TP	VIDEO OUT
ADJ.	3H:VR2008(B-4),6H:VR2007(B-5)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	REC → PLAY/PAUSE
M.EQ	MONITOR TV
SPEC.	NO V-DANCING ON MONITOR TV

Note: *SLOW TRACKING adjustment should be completed before this adjustment.*

1. Set the V LOCK volume VR6901(3H) and VR6902(6H) to center position on the rear jack panel.
2. Record the colour bar signal a few minute in the 3H and 6H tape speed mode.
3. Place the unit in STILL mode at 3H recorded portion.
4. Adjust VR2008 so that the V-dancing does not appear on monitor screen.
5. Place the unit in STILL mode at 6H recorded portion.
6. Adjust VR2007 so that the V-dancing does not appear on monitor screen.

4-2-5. OSD AGC LEVEL ADJ.

BOARD	MAIN C.B.A.
TP	TP3005(H-2)
ADJ.	VR3201(E-5)
TAPE	
INPUT	COLOUR BAR
MODE	EJECT
M.EQ	OSCILLOSCOPE
SPEC.	2.0±0.1Vp-p

1. Supply the colour bar signal to video input.
2. Connect the oscilloscope to TP3005.
4. Adjust VR3201 so that video level becomes 2.0 ± 0.1 Vp-p.

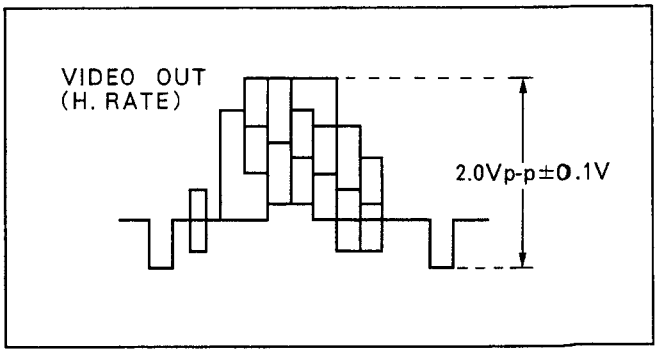


Fig. E2

4-2-6. CHARACTER POSITION ADJ.

BOARD	VIDEO SUB C.B.A.
TP	VIDEO OUT
ADJ.	CT3201(E-5)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	STOP
M.EQ	MONITOR TV
SPEC.	SEE FIGURE

1. Supply a colour bar signal to video input.
2. Set the MENU/REC LOCK SW to MENU side and select the MENU SCREEN 3.
3. The character display position set to R-UPPER.
4. Adjust CT3201 so that the "H" of time mode display is positioned as shown in figure E3.

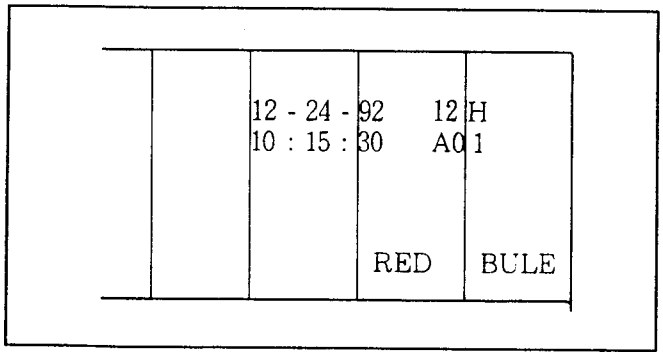


Fig. E3

4-2-7. VIDEO RECORDING CURRENT ADJ.

BOARD	MAIN C.B.A.
TP	TP507(HOT),TP508(GND) (HEAD AMP)
ADJ.	Y:VR3505(D-3),C:VR3504(E-3)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	REC
M.EQ	OSCILLOSCOPE
SPEC.	Y=130±5mVp-p, C=32±2mVp-p

Note: *The oscilloscope probe should be use under 5 feet longer cable and set 10:1.*

1. Place the unit in recording(3H) mode with colour bar signal.
2. Connect the oscilloscope between TP507(HOT) and TP508(GND) on the HEAD AMP C.B.A.
3. Turn the VR3505 fully clockwise from foil side.
4. Adjust VR3504 so that the cyan level becomes 32 ± 2 mVp-p and adjust VR3505 so that the sync level becomes 130 ± 5 mVp-p.

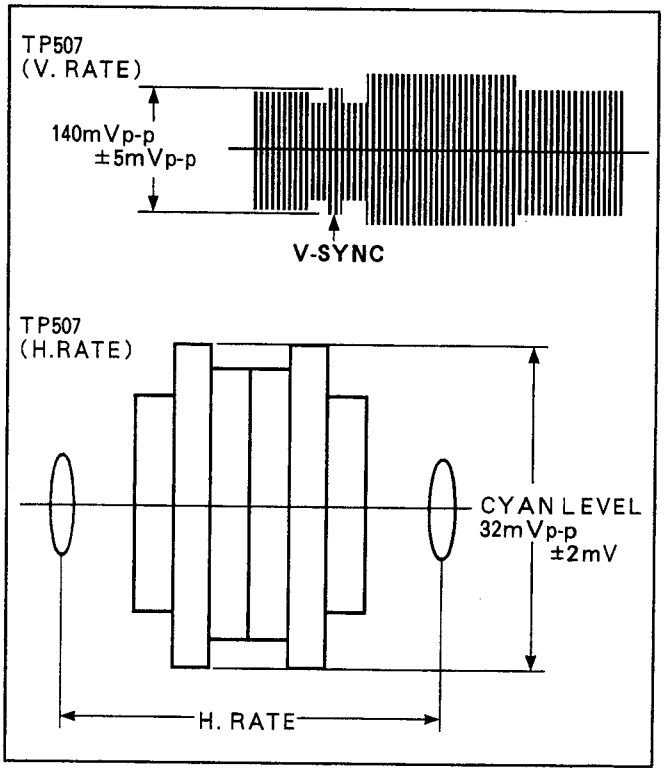


Fig. E4

4-2-8. VIDEO PLAYBACK LEVEL ADJ.

BOARD	MAIN C.B.A.
TP	VIDEO OUT
ADJ.	VR3502(F-3)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	REC → PLAY
M.EQ	OSCILLOSCOPE
SPEC.	Y=1.0±0.05Vp-p,C=0.6±0.03Vp-p

1. Connect the video out to the oscilloscope with a 75ohm termination.
2. Record the colour bar signal a few minute and playback just recorded portion
3. Adjust VR3502 so that the cyan level becomes 0.6 ± 0.03Vp-p.
4. Confirm that the video level is 1.0 ± 0.05Vp-p.

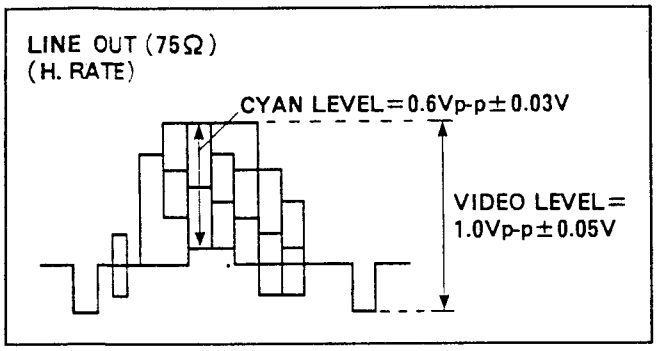


Fig. E5

4-2-9. Y BALANCE ADJ.

BOARD	MAIN C.B.A.
TP	TP3003(G-5)
ADJ.	VR3501(C-7)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	REC → PLAY
M.EQ	OSCILLOSCOPE
SPEC.	LESS THAN 80mVp-p

1. Supply a colour bar signal to video input.
2. Record the colour bar signal a few minute and playback just recorded portion.
3. Connect the oscilloscope to TP3003 with a capacitor(1000pF) as shown in Fig.E6.
4. Adjust VR3501 so that the portion of shown in Fig.E6 becomes less than 80mVp-p.

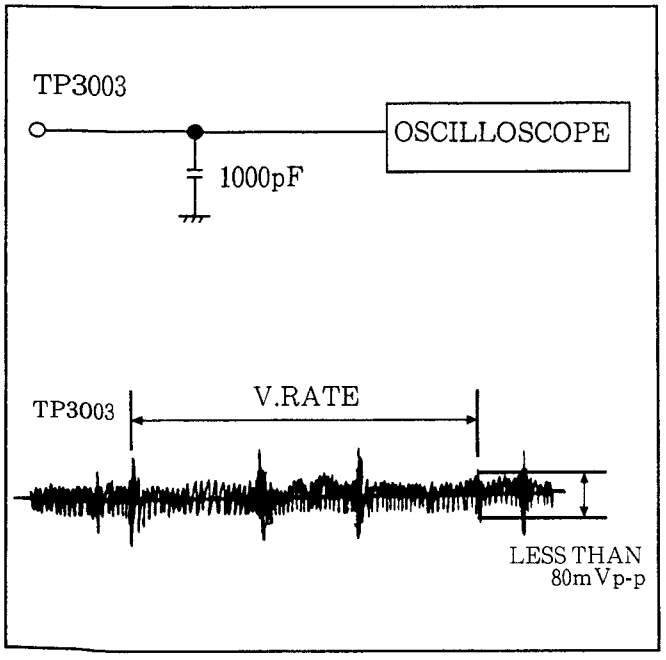


Fig. E6

4-2-10. FREQUENCY RESPONSE ADJ.

BOARD	MAIN C.B.A.
TP	VIDEO OUT
ADJ.	3H:VR3503(F-3),6H:VR3506(F-4)
TAPE	BLANK TAPE
INPUT	30% VIDEO SWEEP (W/O:Burst)
MODE	REC → PLAY
M.EQ	OSCILLOSCOPE
SPEC.	100K : 2MHz=5 : 6.0±0.5

1. Connect video out to the oscilloscope.
2. Set the SHARPNESS mode to "ON" and VIDEO mode to "B/W" on the on-screen menu.
3. Record the 30% video sweep signal without burst a few minute in the 3H and 6H tape speed mode.
3. Playback just recorded portion.(Vary the vertical scope setting until the 100KHz level reaches 5 divisions)
4. Adjust VR3503 so that the 3H level becomes as shown in Fig.E7 at 3H recorded portion.
5. Adjust VR3506 so that the 6H level becomes as shown in Fig.E7 at 6H recorded portion.

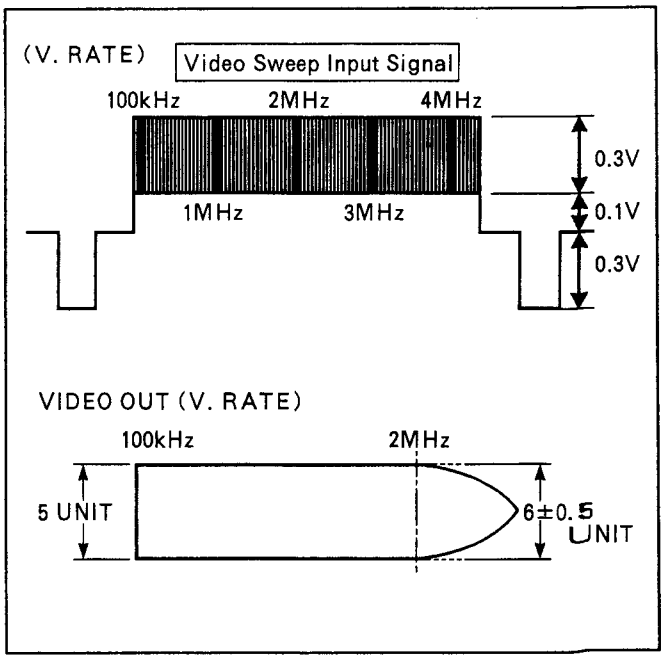


Fig.E7

4-2-11. AUDIO BIAS CURRENT ADJ.

BOARD	MAIN C.B.A.
TP	HOT:TP4001(I-1),COLD:TP4002(I-2)
ADJ.	VR4001(I-1)
TAPE	BLANK TAPE
INPUT	
MODE	REC
M.EQ	VTVM
SPEC.	3.0 ± 0.1mVrms

1. Place the unit in recording mode without audio signal.
2. Connect the VTVM to TP4001(HOT) and TP4002(GND).
3. Adjust VR4001 so that level becomes 3.0 ± 0.1 mVrms.

4-2-12. AUDIO PLAYBACK GAIN ADJ.

BOARD	MAIN C.B.A.
TP	AUDIO OUT
ADJ.	VR4006(I-2)
TAPE	BLANK TAPE
INPUT	1kHz, -10dBV SINEWAVE SIGNAL
MODE	REC → PLAY
M.EQ	VTVM
SPEC.	-8dBV ± 1dB

1. Supply a 1kHz, -10dB sinewave signal to audio input.
2. Place the unit in recording mode with sine wave signal.
3. Connect the VTVM to audio output.
4. Playback the just recorded portion.
5. Adjust VR4006 so that playback level becomes -8dBV ± 1 dB.

4-3. MECHANICAL ADJUSTMENT INFORMATION

This section contain the supplementary information of Mechanical Adjustment Procedure for K-Mechanisum.
Please refer to the K-Mechanisum service manual (Order No. VSD9402M632) .

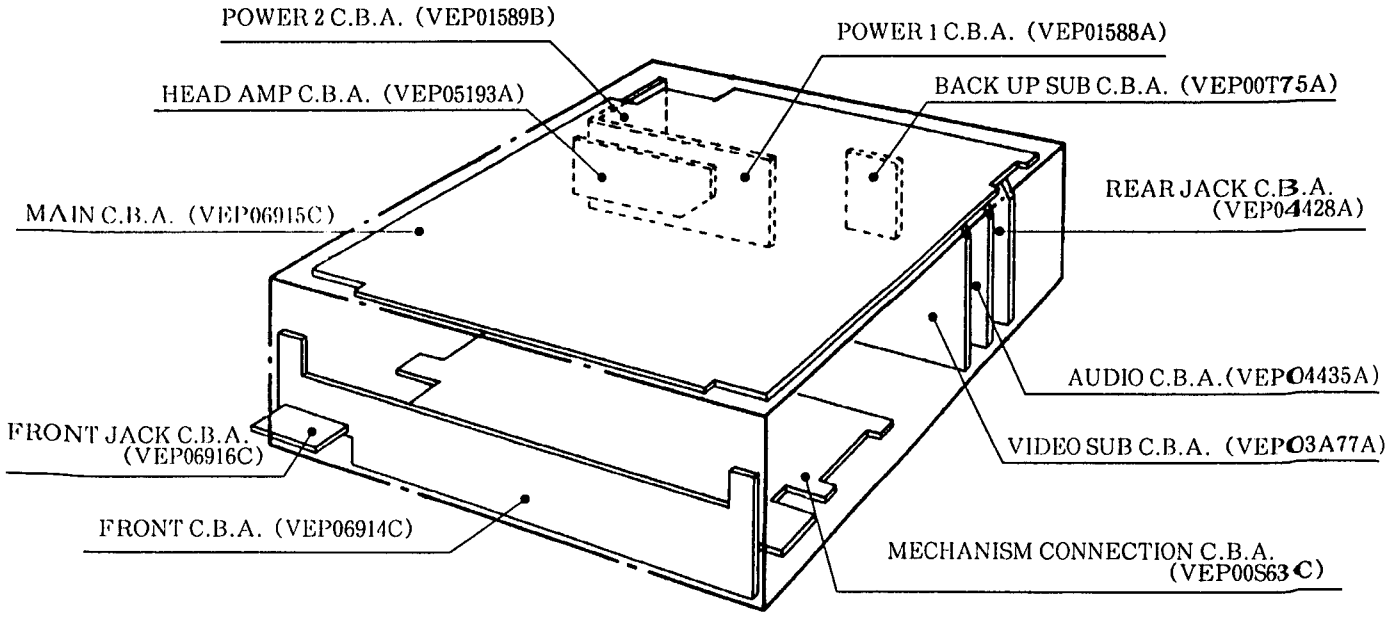
1. TEST POINT

INTERCHANGEABILITY ADJUSTMENT	VIDEO RF SIGNAL	TP507,TP508 (GND) HEAD AMP C.B.A.
	HEAD SWITCHING PULSE	TP3502 MAIN C.B.A.
TRACKING FIX POISION (Inhibit of Auto Tracking)	JUMPER SHORT	TP6002 and TP6003 MAIN C.B.A.

2. SPECIFICATION

3-8. BACK TENSION	22.5 ~ 27.5 g
3-11. FG GAP	0.15 ± 0.01mm
3-12. PINCH PRESSING FORCE	1140 ± 250 g

CIRCUIT BOARD LAYOUT



BLOCK DIAGRAMS
SCHEMATIC DIAGRAMS
AND
CIRCUIT BOARDS

NOTE : How to read the Schmatic diagram.

MIJISSO ⇒ No circuits construct for AG-6124.

D183(D183E) ⇒ AG-6124 used this circuits.

D183,D184,D187 ONLY ⇒ AG-6124 used this circuits.

D184 ONLY ⇒ No circuits construct for AG-6124.

D182 ONLY ⇒ No circuits construct for AG-6124.

D187 ONLY ⇒ No circuits construct for AG-6124.

* mark ⇒ Parts value, see table in the schematic diagram.

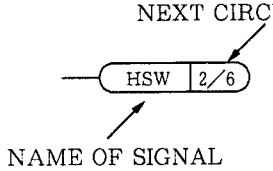
(EX:)

D183, D183E or PAL AG-6124 used this circuits.

	D184
R2018	10K
R2019	----------

10KΩ
No part

(EX:)



TITLE OF CIRCUIT	CIRCUIT NO.
SYSCON/SERVO	1/6
MOTOR DRIVE	2/6
INTERFACE	3/6
VIDEO 1 (Y)	4/6
VIDEO 2 (C)	5/6
AUDIO (MAIN)	6/6

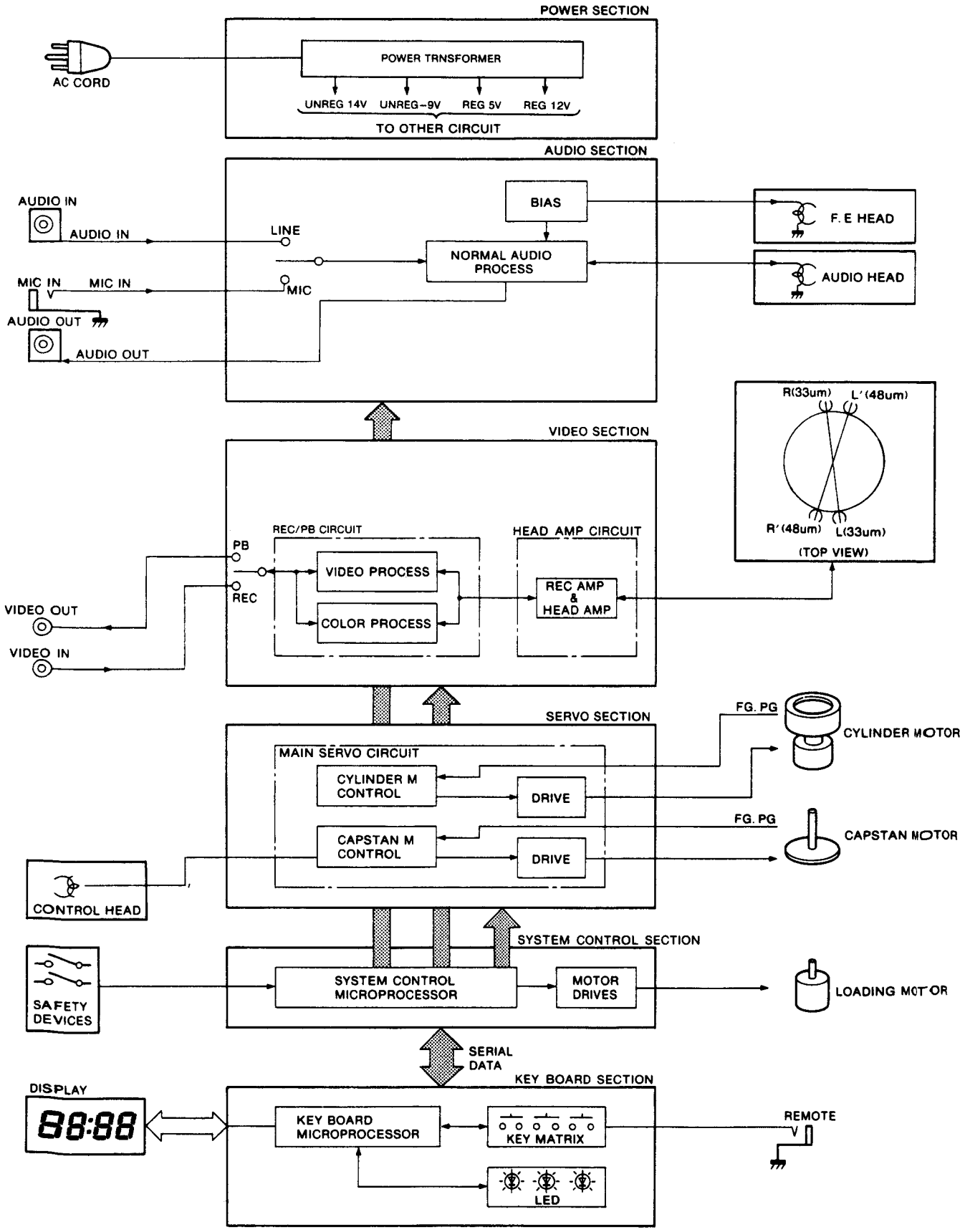
NOTE : Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since this drawing was prepared.

5-1. ABBREVIATIONS

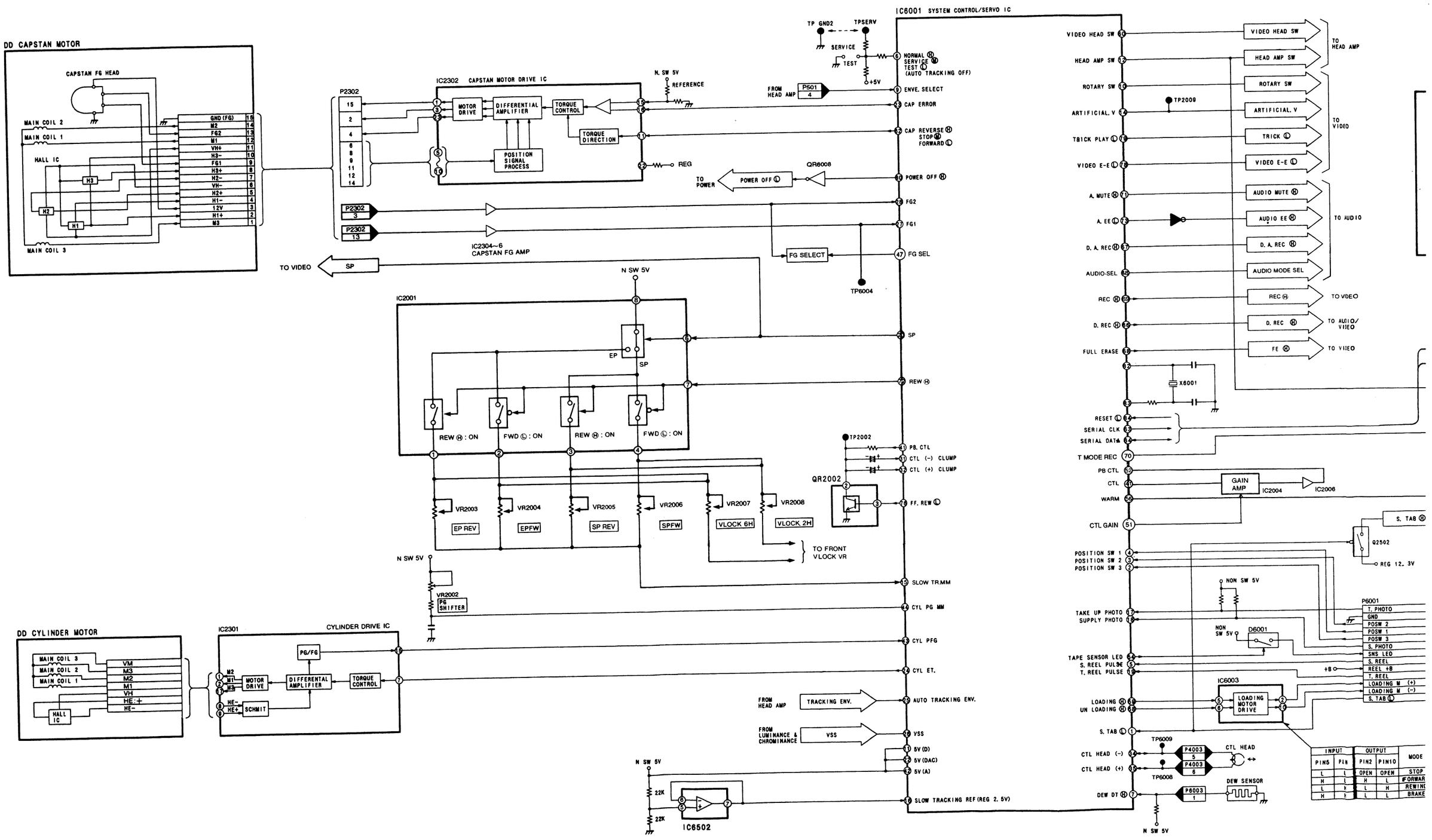
A MODE SEL	AUDIO MODE SELECT
A.DUB.P(L)	AUDIO DUBBING PAUSE (L)
A.E.HEAD	AUDIO ERASE HEAD
A.HEAD(R)	AUDIO HEAD (REC)
A.HEAD(W)	AUDIO HEAD (PLAY)
A_ HSW	AUDIO HEAD SWITCING PULSE
AE	AUDIO ERASE
AGC	AUTO GAIN CONTROL
AGC ON(H)	AUTO GAIN CONTROL ON (H)
AL(AUDIO)	AUDIO L-CH SIGNAL
ANALOG REM IN	ANALOG REMOTE SIGNAL IN
ANALOG_ IN	ANALOG REMOTE SIGNAL IN
AR(AUDIO)	AUDIO R-CH SIGNAL
ART_ V	ARTIFICAL VERTICAL SYNC SIGNAL
AUDIO EE(H)	AUDIO EE MODE (H)
AUTO OFF OUT	AUTO OFF SIGNAL OUT
BACK SYS 5V	BACK UP 5V FOR SYSTEM CONTROL CIRCUIT
BACK UP 5V	BACK UP 5V DC
BIAS	AUDIO BIAS SIGNAL
CAP ET	CAPSTAN ERROR TORQUE CONTROL
CAP FG1	CAPSTAN FG1 PULSE
CAP FG2	CAPSTAN FG2 PULSE
CAP RSF	CAPSTAN REV/STOP/FWD
CAP VM	CAPSTAN DRIVE VOLTAGE
COR	CORREATION SIGNAL
CTL OUT	CONTROL SIGNAL OUT
CTL(+)	CONTROL HEAD (+)
CTL(-)	CONTROL HEAD (-)
CUL	CAPSTAN SPEED CONTROL SIGNAL (H,M,High Impedance)
CYL ET	CYLINDER ERROR TORQUE CONTROL
CYL PFG	CYLINDER PG/FG PULSE
D FM REC (L)	DELAIED FM REOCRDING (L)
D REC (H)	DELAIED RECORDING (H)
DEW SENSE	DEW SENSOR
E_ REC_ 5V	EXCEPT RECORDING 5V
EDIT_ ON(H)	EDIT ON (H)
EE(H)	RECORDING (H)
ENV_ SEL	RF ENVELOPE SELECT
ENVE.OUT	RF ENVELOPE SIGNAL OUT
FE(1)	FULL ERASE(1)
FE(2)	FULL ERASE(2)
FLY E	FLYING ERASE
FM MUTE(H)	FM AUDIO MUTE (H)
H_ A_ SW	HEAD AMP SWITCING PULSE
H_ METER_ RST	HOUR METER RESET
HIFI REC(L)	FM AUDIO RECORDING(L)
HSS	HORIZONTAL SYNC SIGNAL
HSW	HEAD SWITCING PULSE
L(EP)	VIDEO L-CH FOR EP MODE
L(SP)	VIDEO L-CH FOR SP MODE
LOADING M(+)	LOADING MOTOR (+)
LOADING M(-)	LOADING MOTOR (-)
M GND	MOTOR GND
METER_ CH1	AUDIO METER CH1
METER_ CH2	AUDIO METER CH2
MIC GND	MICROPHONE GND
MIC IN	MICROPHONE SIGNAL INPUT
MIC(H)	MICROPHONE SIGANL REC (H)
MIX OUT	AUDIO CH1/CH2 SIGNAL MIX OUTPUT
NOR REC(L)	NORMAL AUDIO RECORDING(L)
PB LEVEL	PLAYBACK SIGNAL LEVEL
PB SIGNAL	PLAYBACK VIDEO SIGNAL
PFG	PG/FG
POS SW1~3	MECHANISUM POSITION SWITCH
POWER OFF(L)	AC POWER OFF (L)
R(EP)	VIDEO R-CH FOR EP MODE
R(SP)	VIDEO R-CH FOR SP MODE
REC GATE(L)	RECORDING GATE (L)
REC_ C	RECORDING CHROMINANCE SIGNAL
REC_ Y	RECORDING LUMINANCE SIGNAL
REC(H)	RECORDING (H)
REEL + B	REEL PHOTE SENSOR DC
RF_ C	RF CHROMINANCE SIGNAL
RF_ OUT	RF SIGNAL OUT
RF_ Y	RE LUMINANCE SIGNAL
RF_ Y_ IN	RF LUMINANCE SIGNAL INPUT
RE_ Y_ OUT	RF LUMINANCE SIGNAL OUTPUT
ROTARY SW	ROTARY SWITCH
S NONSW 5V	NON SWITCING 5V FOR SYSTEM CONTROL CIRCUIT
S PHOTO	SUPPLY REEL PHOTO SENSOR
S REEL	SYPPLY REEL PULSE
S TAB SW	SAFETY TAB SWITCH
S VHS(H)	SVHS SIGNAL DETECT (H)
SCK F	SERIAL CLOCK FOR FRONT

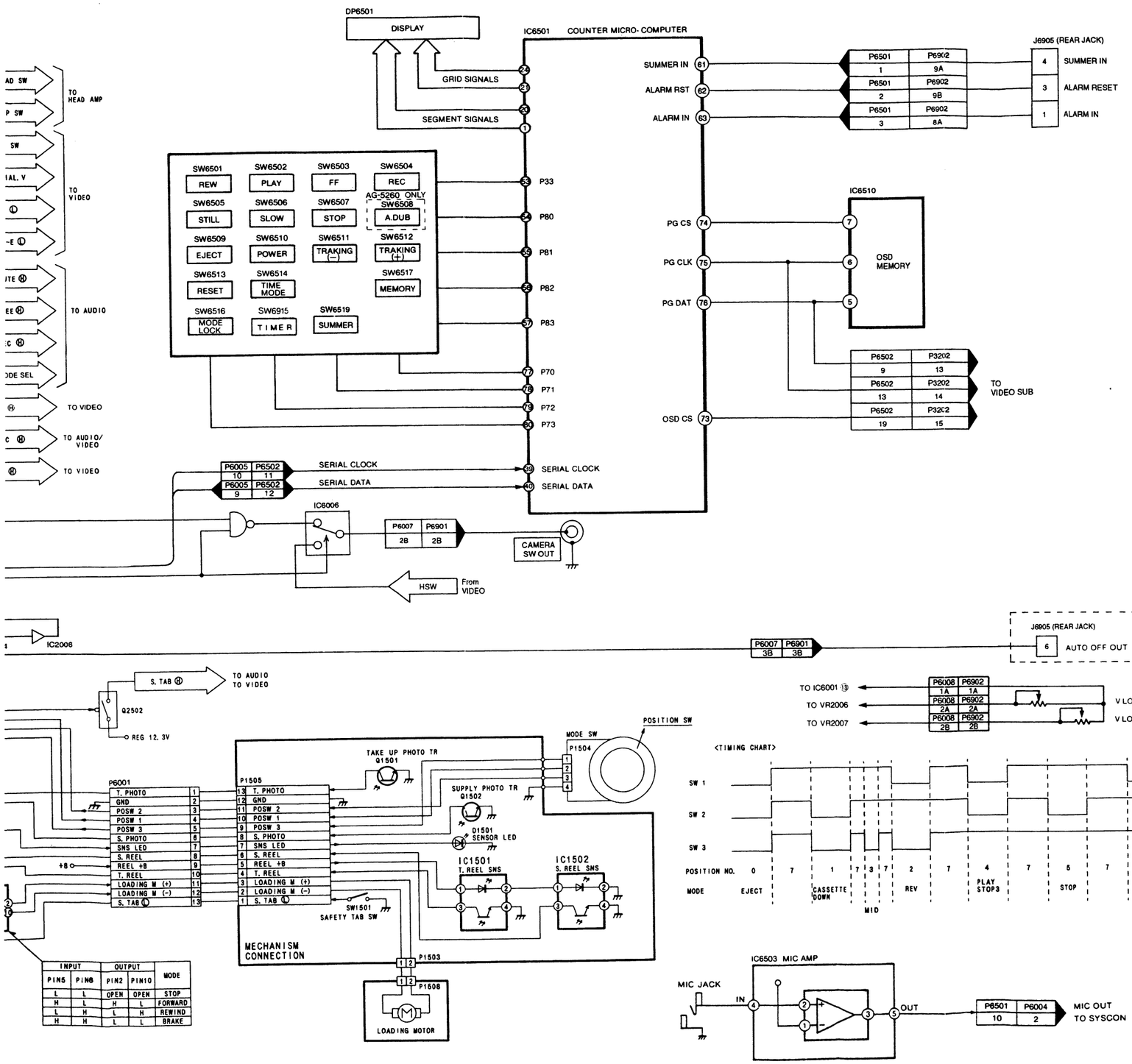
SDA F	SERIAL CLOCK FOR FRONT
SERIAL IN	SERIAL REMOTE SIGNAL IN
SERIAL OUT	SERIAL REMOTE SIGNAL OUT
SFR	MOTOR DIRCTION STOP/ FWD/ REV
SNS LED	SENSOR LED
SP/ EP	SP/ EP MODE SELECT
T PHOTO	TAKE UP PHOTO TRANSISTOR
T REEL	TAKE UP REEL PULSE
TRAC ENV	TRACKING ENVELOPE
TRICK (L)	STILL,SEARCH MODE (L)
UNREG −9V	UNREGULATOR −9V
UNREG 14V	UNREGULATOR 14V
V LOCK 2H	VERTICAL LOCK 2H SPEED
V LOCK 6H	VERTICAL LOCK 6H SPEED
V NONSW 5V	NON SWITCHING 5V FOR VIDEO
V SYNC	VERTICAL SYNC SIGNAL
VIDEO EE(L)	VIDEO RECORDING MODE (L)
VR CH1	AUDIO CH1 RECORDING VOLUME
VR CH2	AUDIO CH2 RECORDING VOLUME
YNR_IN	LUMINANCE NOISE REDUCTION SIGNAL IN
YNR_OUT	LUMINANCE NOISE REDUCTION SIGNAL OUT

5-2. OVERALL BLOCK DIAGRAM

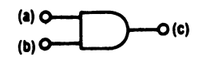
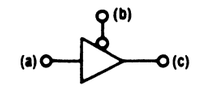
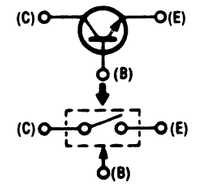
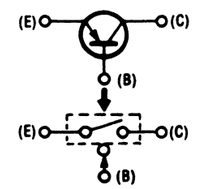
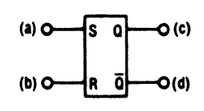


5-3. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

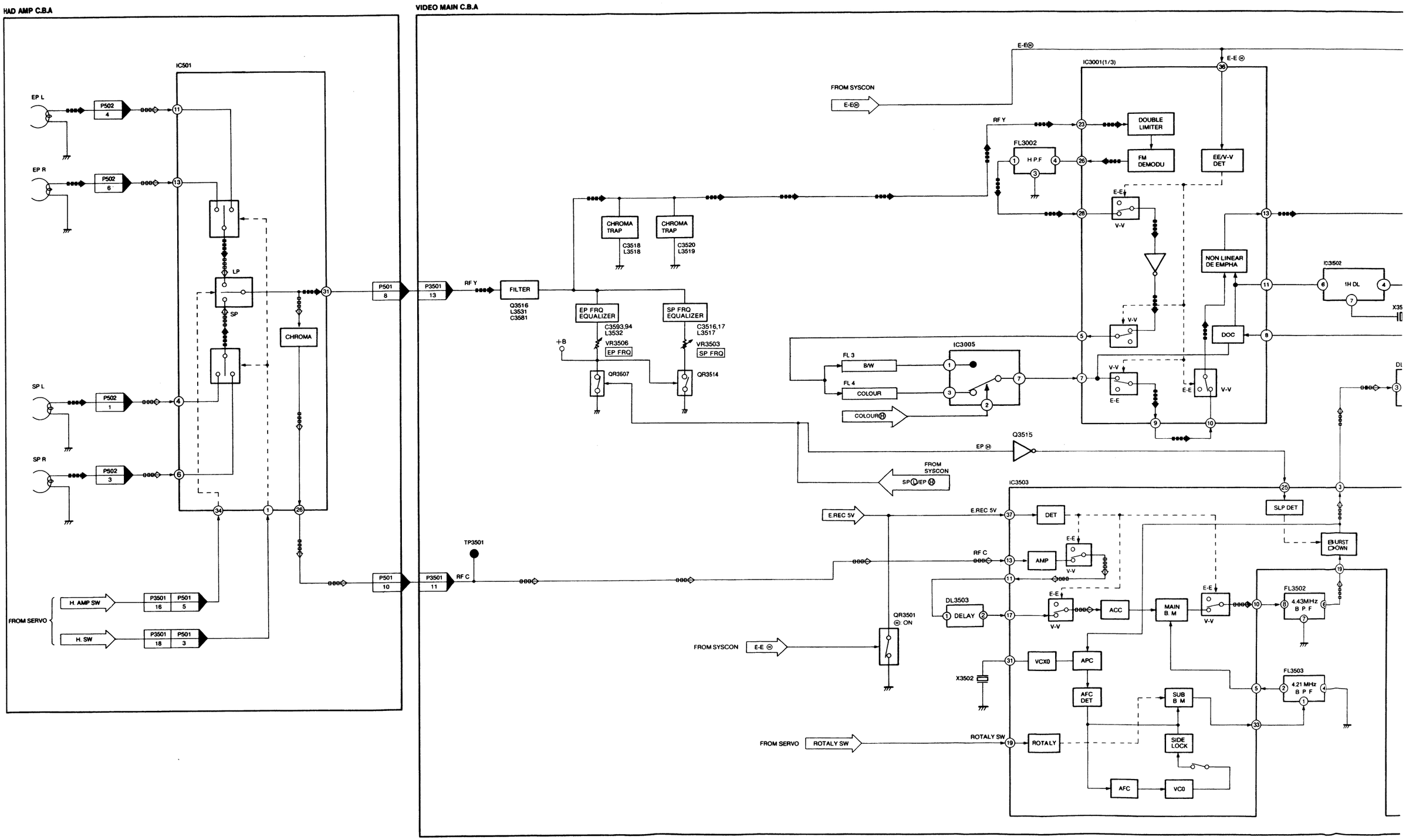




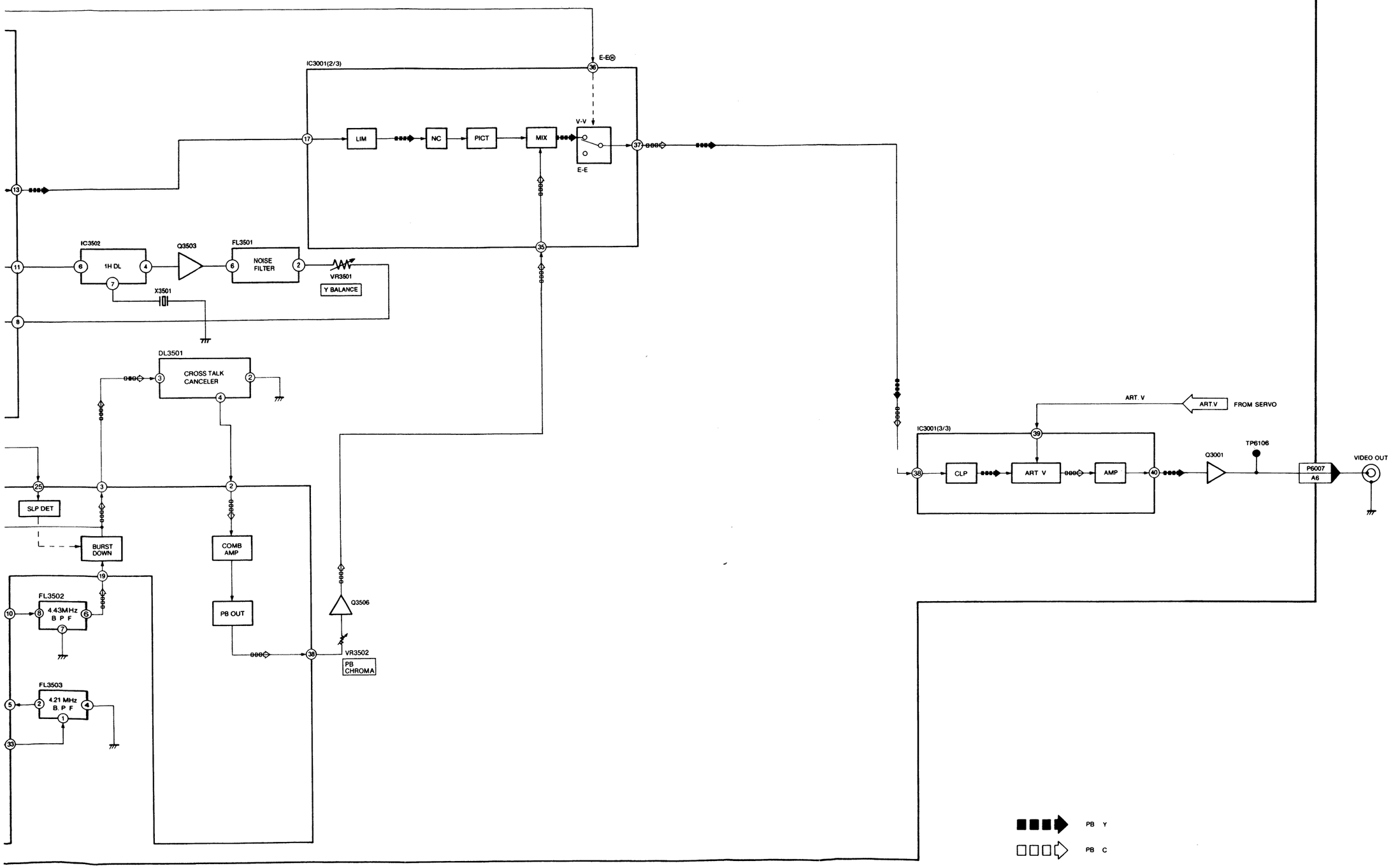
INPUT		OUTPUT		MODE
PIN5	PIN6	PIN2	PIN10	
L	L	OPEN	OPEN	STOP
H	L	H	L	FORWARD
L	H	L	H	REWIND
H	H	L	L	BRAKE

SYMBOL	TRUTH VALUE TABLE
INVERTER	IN (a) H L; OUT (b) L H
COMPARTOR	IN (a)/(b); (a)>(b): OUT (c) H; (a)<(b): OUT (c) L
AND CIRCUIT 	IN (a) L L H H; (b) L H L H; OUT (c) L L L H
OR CIRCUIT	IN (a) L L H H; (b) L H L H; OUT (c) L H H H
THREE STATES BUFFER 	IN (a) H L H or L; (b) L L H; OUT (c) H L ※
	※ High Impedance
TR. SW (NPN TYPE) 	BASE H L; TR. SW ON OFF
TR. SW (PNP TYPE) 	BASE H L; TR. SW OFF ON
R-S TYPE FLIP-FLOP 	IN (a) L L ⎍; (b) L ⎍ L; OUT (c) ※ L H; (d) ◆ H L
	※ Initial condition is maintained. ◆ Initial condition is reversed.

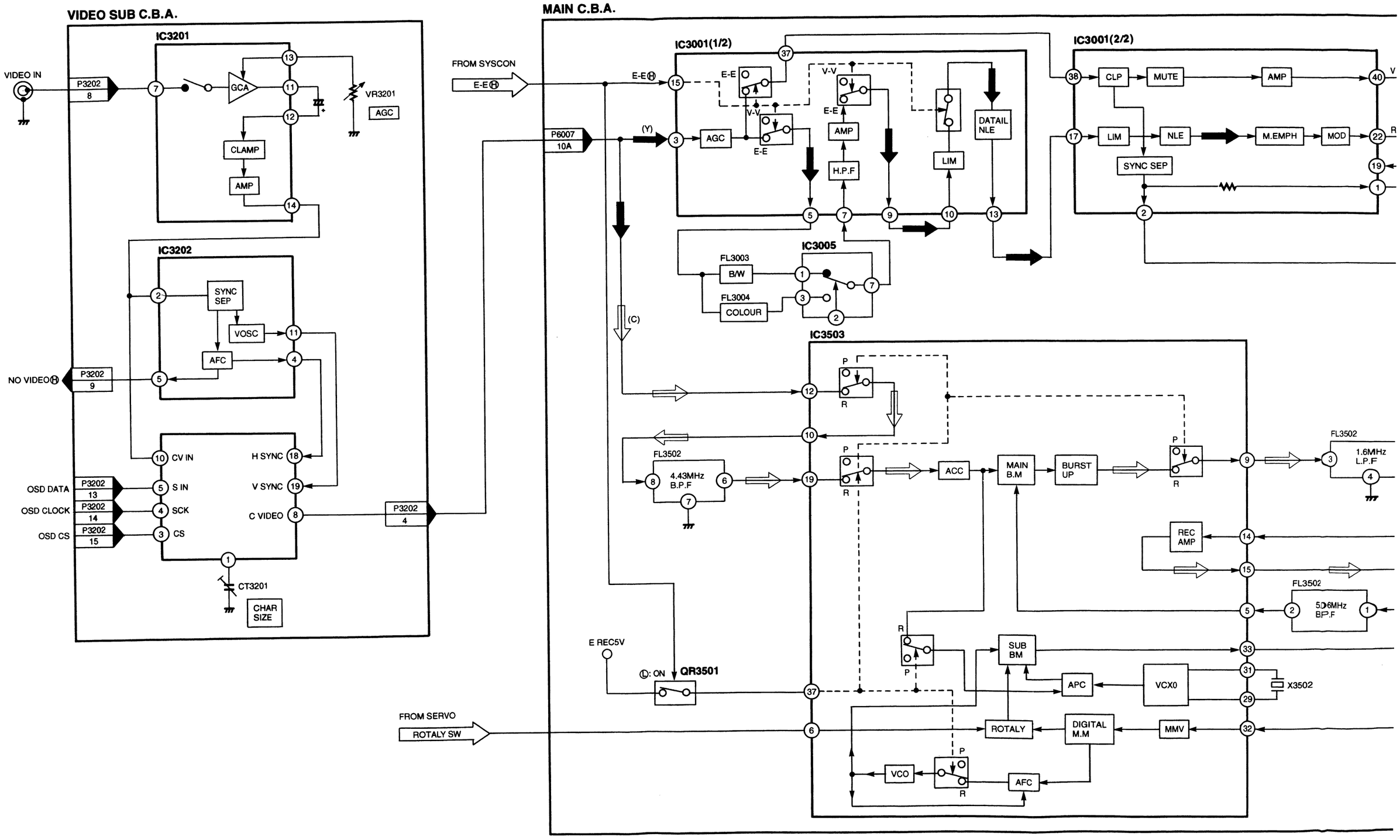
5-4. VIDEO (PLAY) BLOCK DIAGRAM

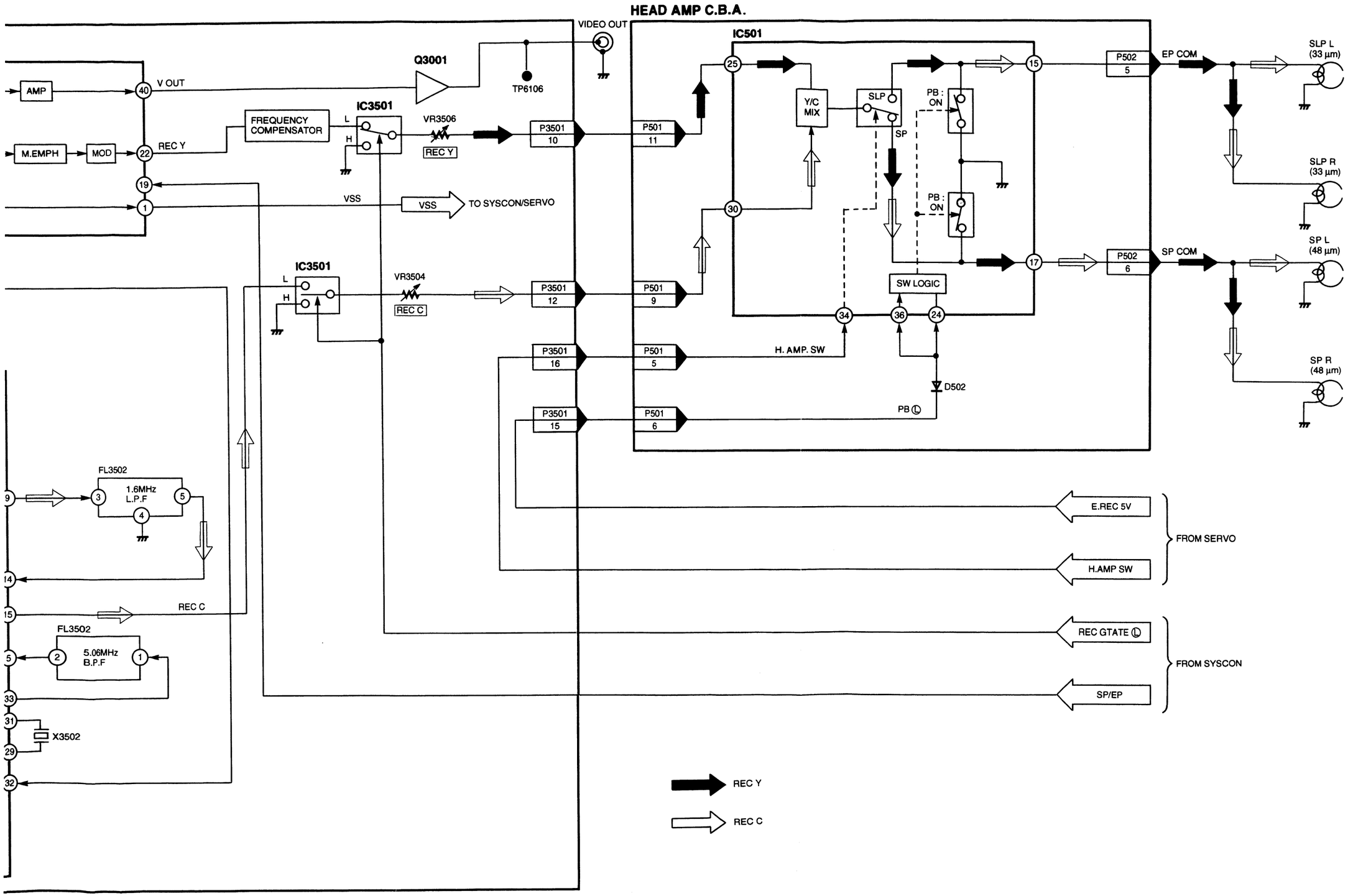


BLK — 5

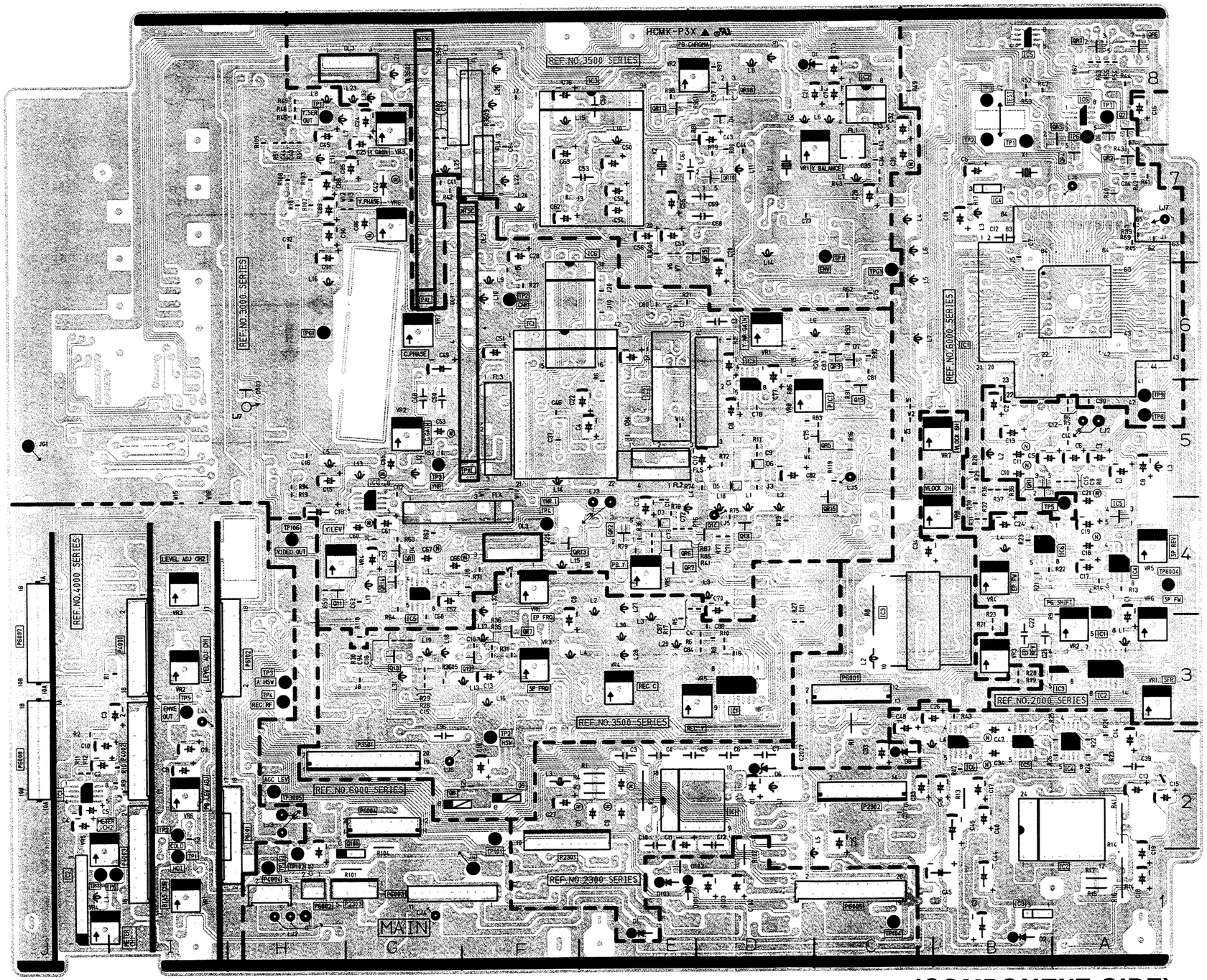

IC3001(2/3)
E-E
LIM
NC
PICT
MIX
V-V
E-E
IC3502
1H DL
Q3503
FL3501
NOISE FILTER
VR3501
Y BALANCE
X3501
DL3501
CROSS TALK CANCELER
SLP DET
BURST DOWN
COMB AMP
PB OUT
Q3506
VR3502
PB CHROMA
FL3502
4.43MHz B P F
FL3503
4.21 MHz B P F
ART. V
ART.V
FROM SERVO
IC3001(3/3)
CLP
ART. V
AMP
Q3001
TP6106
P6007
A6
VIDEO OUT
PB Y
PB C

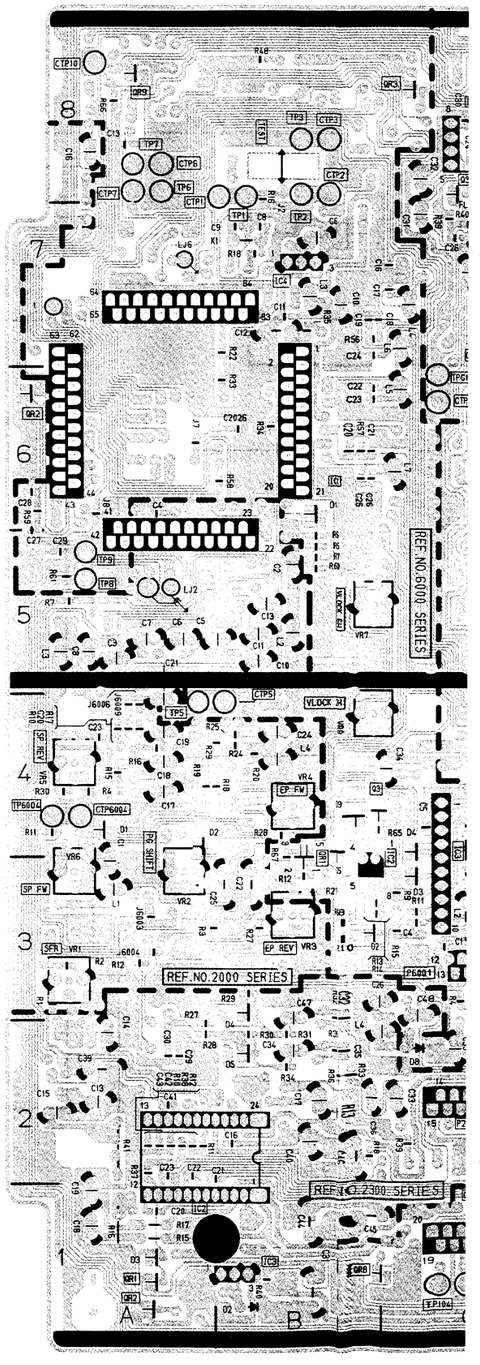
5-5. VIDEO (REC) BLOCK DIAGRAM



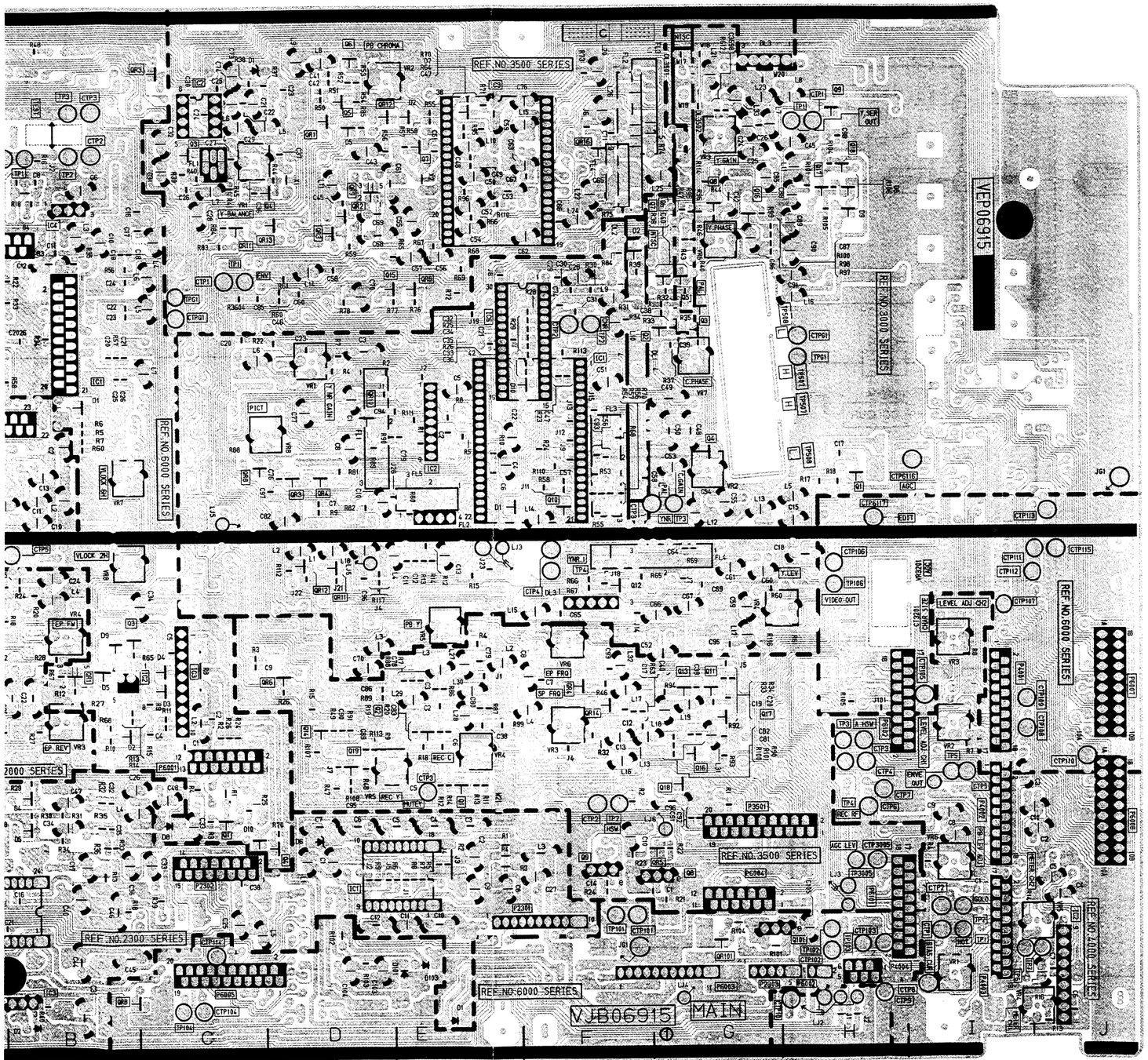

HEAD AMP C.B.A.
VIDEO OUT
IC501
Q3001
TP6106
AMP
V OUT
M.EMPH
MOD
REC Y
FREQUENCY COMPENSATOR
IC3501
L
H
VR3506
REC Y
P3501 10
P501 11
VSS
VSS
TO SYSCON/SERVO
IC3501
VR3504
REC C
P3501 12
P501 9
P3501 16
P501 5
P3501 15
P501 6
Y/C MIX
SLP
SP
PB : ON
PB : ON
SW LOGIC
H. AMP. SW
D502
PB Ⓛ
P502 5
P502 6
EP COM
SP COM
SLP L (33 µm)
SLP R (33 µm)
SP L (48 µm)
SP R (48 µm)
FL3502
1.6MHz L.P.F
FL3502
5.06MHz B.P.F
X3502
REC C
E.REC 5V
H.AMP SW
FROM SERVO
REC GTATE Ⓛ
SP/EP
FROM SYSCON
REC Y
REC C

6-1. MAIN C.B.A. (VEP06915C)





(COMPONENT SIDE)

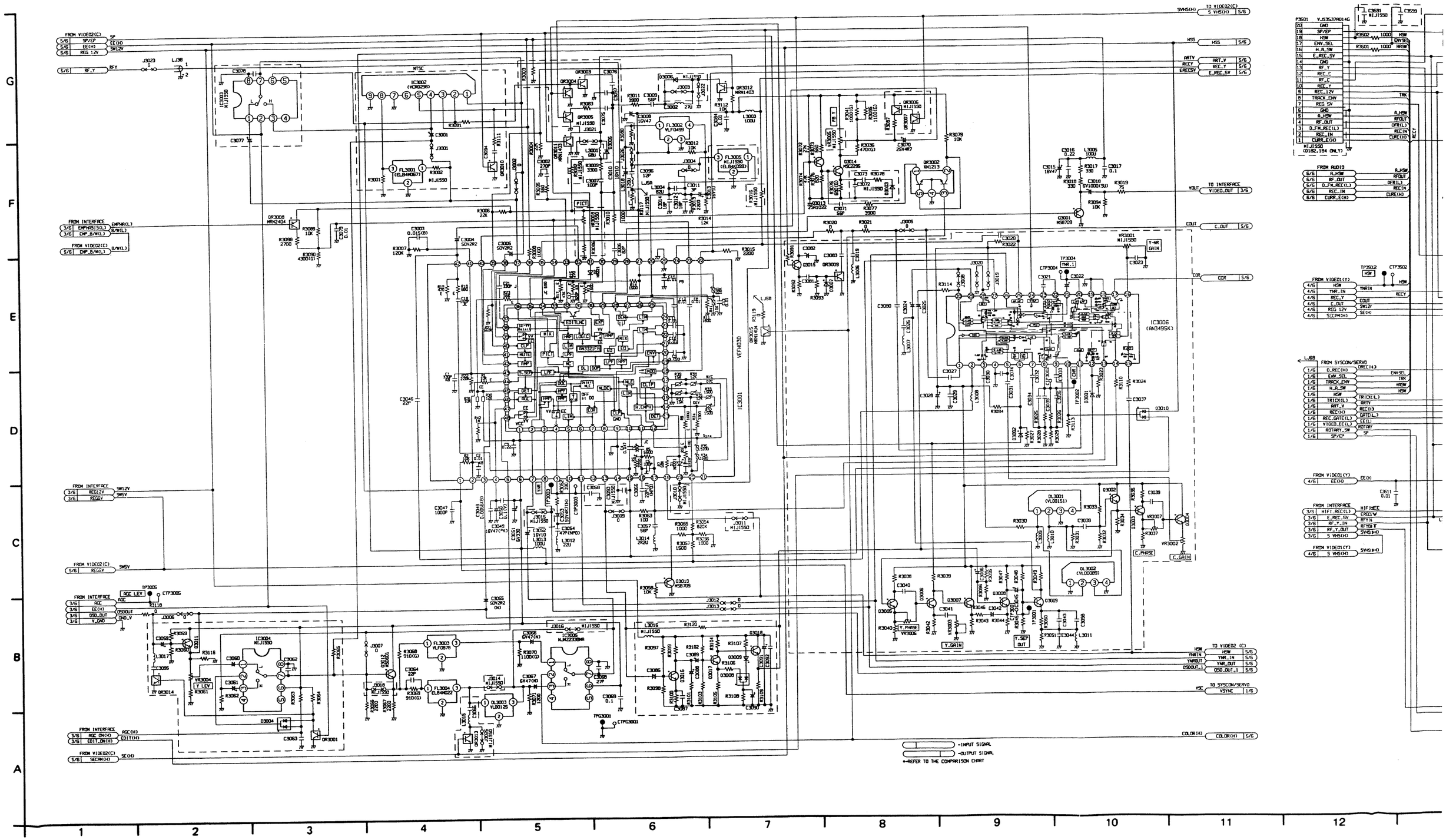


(FOIL SIDE)

MAIN(VEP06915E)					
COMPONENT SIDE				**FOIL SIDE**	
TRANSISTOR		TP4006	I-1	**TRANSISTOR**	
Q3011	H-4	TP4007	J-1	Q3001	H-5
Q3013	D-4	TP6001	B-8	Q3002	G-6
Q3014	D-4	TP6002	B-8	Q3003	G-6
Q3015	C-5	TP6003	B-8	Q3004	G-5
Q3508	G-2	TP6004	A-4	Q3005	G-6
Q3509	F-2	TP6005	A-4	Q3006	G-7
Q3510	G-3	TP6006	A-8	Q3007	G-7
Q3512	F-3	TP6007	A-8	Q3008	G-7
Q6002	A-8	TP6008	A-5	Q3009	H-8
Q6101	G-2	TP6009	A-5	Q3010	F-5
TRANSISTOR RESISTOR		TP6101	F-2	Q3012	F-4
QR2001	B-5	TP6102	H-1	Q3016	G-7
QR3001	G-4	TP6103	H-1	Q3017	H-7
QR3002	E-4	TP6104	C-1	Q3018	H-7
QR3005	C-5	TP6106	H-4	Q3501	E-3
QR3006	E-4	TPG3001	H-6	Q3502	E-3
QR3007	E-4	TPG3501	C-6	Q3503	C-8
QR3009	C-6	**CONNECTOR**		Q3504	D-7
QR3013	F-4	P2301	F-2	Q3505	D-8
QR3014	G-4	P2302	C-2	Q3506	D-8
QR3015	C-5	P2303	G-1	Q3507	E-8
QR3507	F-3	P3501	G-2	Q3511	G-3
QR3510	D-7	P4001	I-3	Q3513	G-3
QR3515	D-7	P4002	I-2	Q3514	D-3
QR3517	E-8	P4003	I-2	Q3515	E-7
QR3518	D-8	P4004	H-1	Q3516	G-3
QR6002	A-7	P6001	C-3	Q3517	G-3
QR6005	A-8	P6002	H-1	Q3518	G-3
QR6006	A-8	P6003	G-1	Q3519	D-3
INTEGRATED CIRCUITS		P6004	G-2	Q6001	C-2
IC2001	A-3	P6005	C-1	Q6004	D-2
IC2004	A-4	P6007	J-3	**TRANSISTOR RESISTOR**	
IC2302	A-2	P6008	J-2	QR2301	A-1
IC2303	B-1	**ADJUSTMENT**		QR2302	A-1
IC2304	A-2	VR2001	A-3	QR3003	D-5
IC2305	B-2	VR2002	A-3	QR3004	D-5
IC2306	B-2	VR2003	B-3	QR3008	C-5
IC3001	F-6	VR2004	B-4	QR3010	D-6
IC3002	E-5	VR2005	A-4	QR3011	D-4
IC3003	D-6	VR2006	A-3	QR3012	D-4
IC3004	G-5	VR2007	B-5	QR3501	D-8
IC3005	G-4	VR2008	B-4	QR3502	D-7
IC3006	F-6	VR3001	D-6	QR3503	D-7
IC3501	D-3	VR3002	G-5	QR3504	F-3
IC3502	C-8	VR3003	G-8	QR3505	G-2
IC3503	E-8	VR3004	G-4	QR3506	D-3
IC4001	J-2	VR3005	E-4	QR3508	E-7
IC4002	J-1	VR3006	G-7	QR3509	D-7
IC6001	A-6	VR3007	G-6	QR3511	C-7
IC6003	C-4	VR3008	D-5	QR3512	D-8
IC6004	B-7	VR3501	C-7	QR3513	D-7
IC6006	A-8	VR3502	D-8	QR3514	F-3
TESTPOINT		VR3503	F-3	QR3516	F-8
TP3001	H-8	VR3504	E-3	QR6001	B-4
TP3002	F-6	VR3505	D-3	QR6008	B-1
TP3003	G-5	VR3506	F-4	QR6101	G-1
TP3004	F-4	VR4001	I-1	**INTEGRATED CIRCUITS**	
TP3005	H-2	VR4002	I-3	IC6002	B-3
TP3501	C-7	VR4003	I-4		
TP3502	F-3	VR4004	J-1		
TP4001	I-1	VR4005	J-2		
TP4002	I-2	VR4006	I-2		
TP4003	H-3				
TP4004	H-3				
TP4005	I-3				

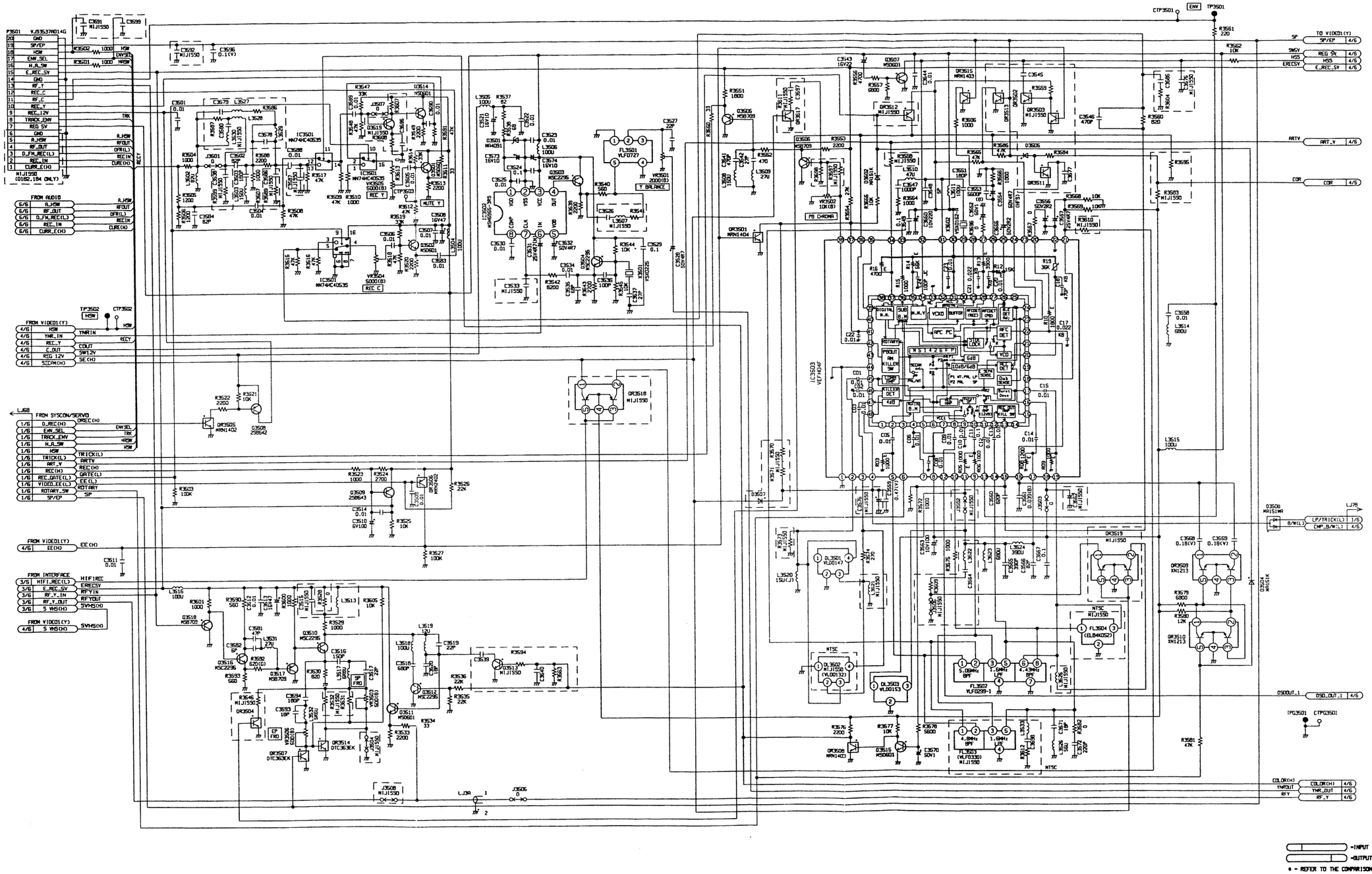
ADDRESS INFORMATION

6-2. VIDEO 1 SCHEMATIC DIAGRAM

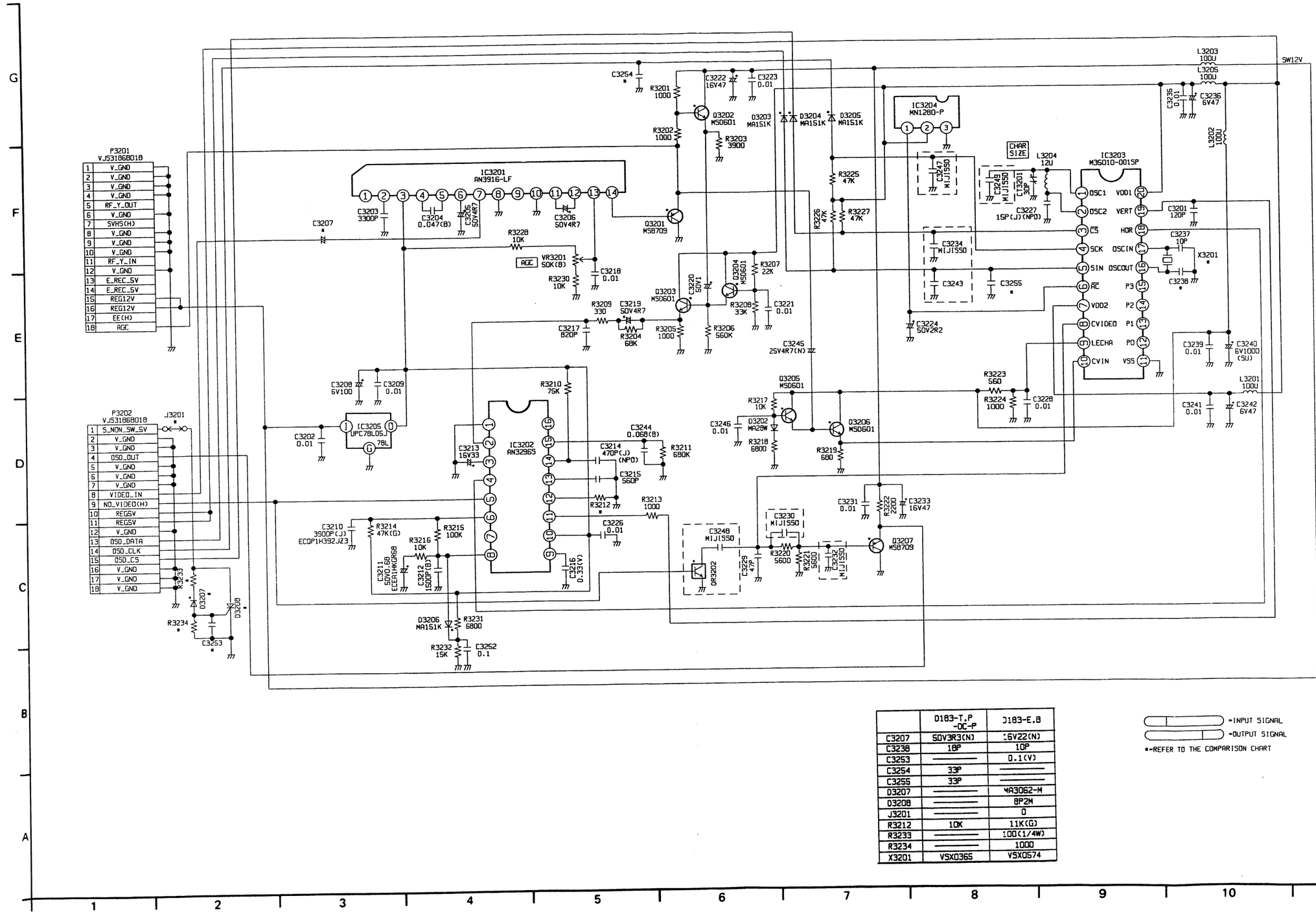


6-3. VIDEO 2 SC

6-3. VIDEO 2 SCHEMATIC DIAGRAM

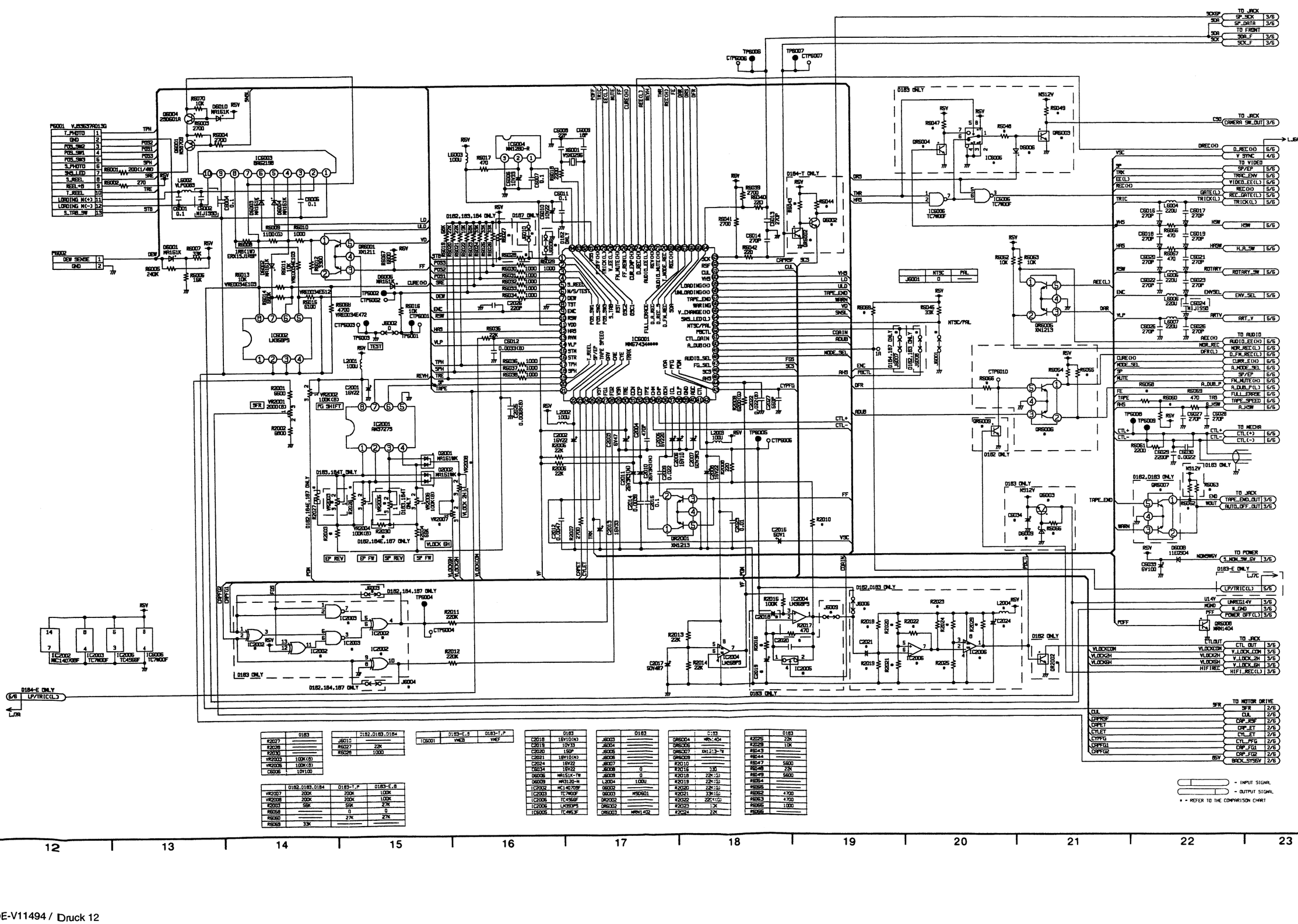


6-4. VIDEO SUB SCHEMATIC DIAGRAM

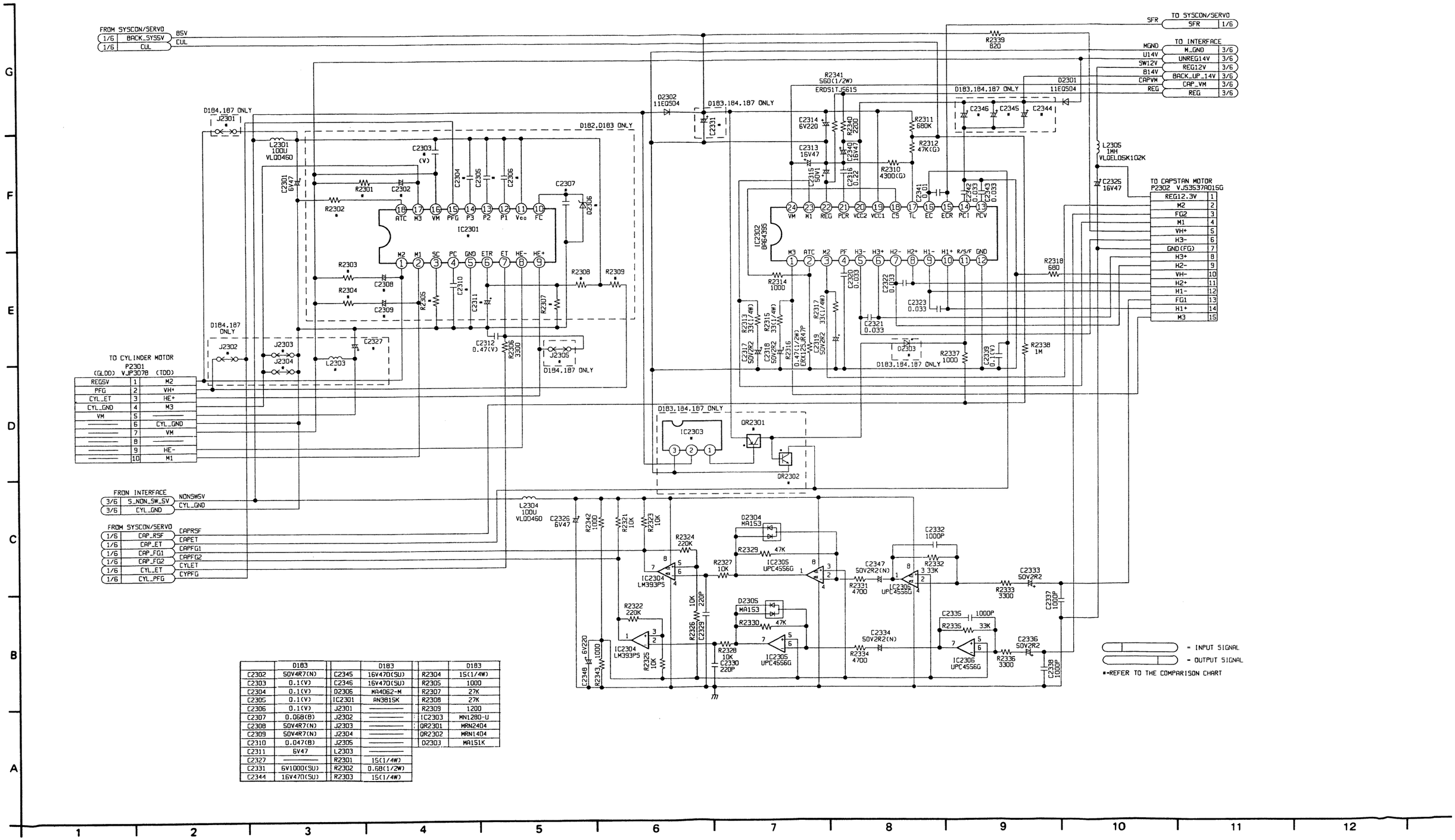


	D183-T,P -DC-P	D183-E,B
C3207	50V3R3(N)	16V22(N)
C3238	18P	10P
C3253	———	0.1(V)
C3254	33P	———
C3255	33P	———
D3207	———	4A3062-M
D3208	———	BP2M
J3201	———	0
R3212	10K	11K(G)
R3233	———	100(1/4W)
R3234	———	1000
X3201	VSX0365	VSX0574

6-5. SYSTEM CONTROL & SERVO SCHEMATIC DIAGRAM

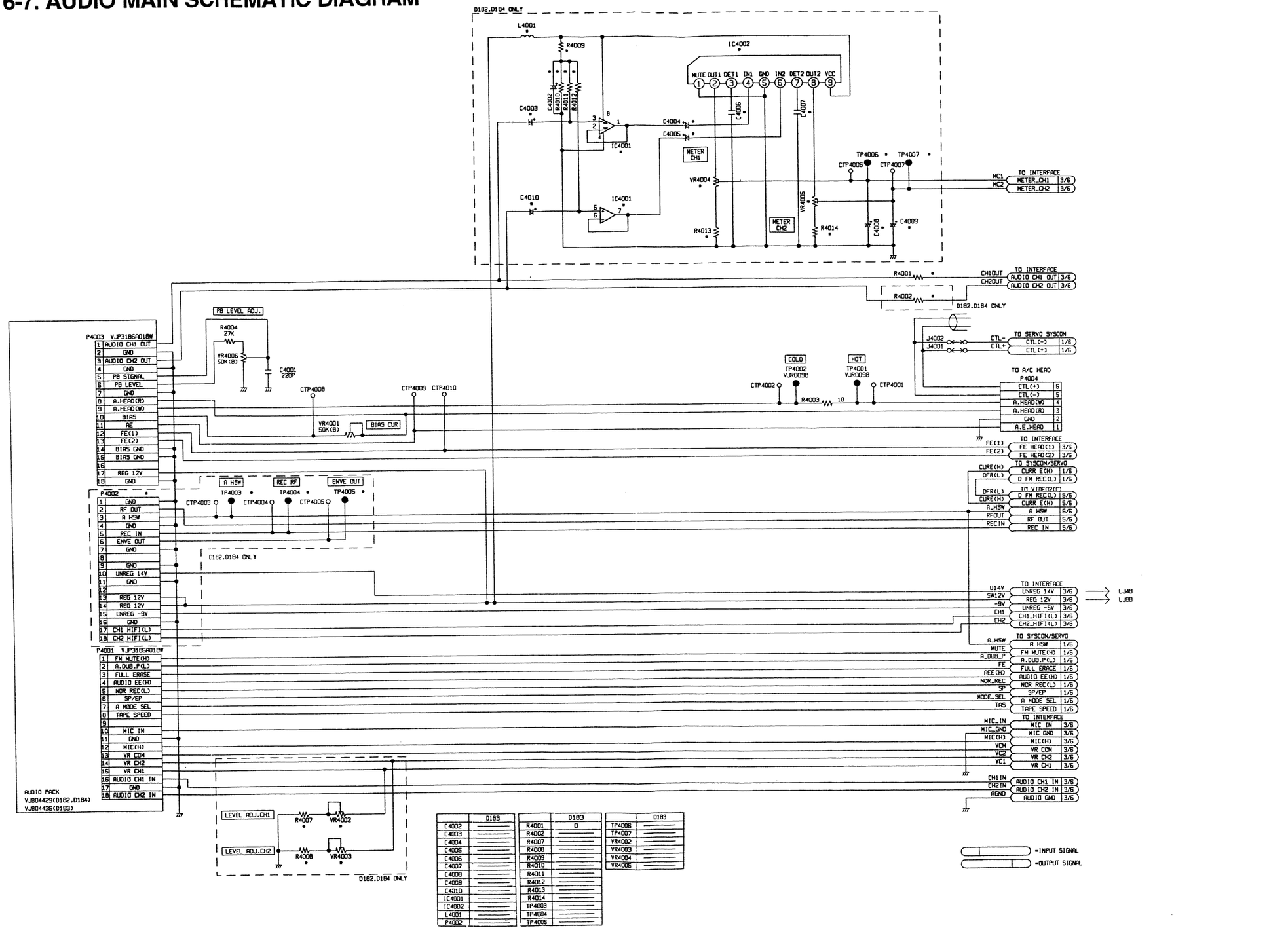


6-6. MOTOR DRIVE SCHEMATIC DIAGRAM



	D183		D183		D183
C2302	50V4R7(N)	C2345	16V470(SU)	R2304	15(1/4W)
C2303	0.1(V)	C2346	16V470(SU)	R2305	1000
C2304	0.1(V)	D2306	MA4062-M	R2307	27K
C2305	0.1(V)	IC2301	AN3815K	R2308	27K
C2306	0.1(V)	J2301	———	R2309	1200
C2307	0.068(B)	J2302	———	IC2303	MN1280-U
C2308	50V4R7(N)	J2303	———	QR2301	MRN2404
C2309	50V4R7(N)	J2304	———	QR2302	MRN1404
C2310	0.047(B)	J2305	———	D2303	MA151K
C2311	6V47	L2303	———		
C2327	———	R2301	15(1/4W)		
C2331	6V1000(SU)	R2302	0.68(1/2W)		
C2344	16V470(SU)	R2303	15(1/4W)		

6-7. AUDIO MAIN SCHEMATIC DIAGRAM



	D183
C4002	
C4003	
C4004	
C4005	
C4006	
C4007	
C4008	
C4009	
C4010	
IC4001	
IC4002	
L4001	
P4002	

	D183
R4001	0
R4002	
R4007	
R4008	
R4009	
R4010	
R4011	
R4012	
R4013	
R4014	
TP4003	
TP4004	
TP4005	

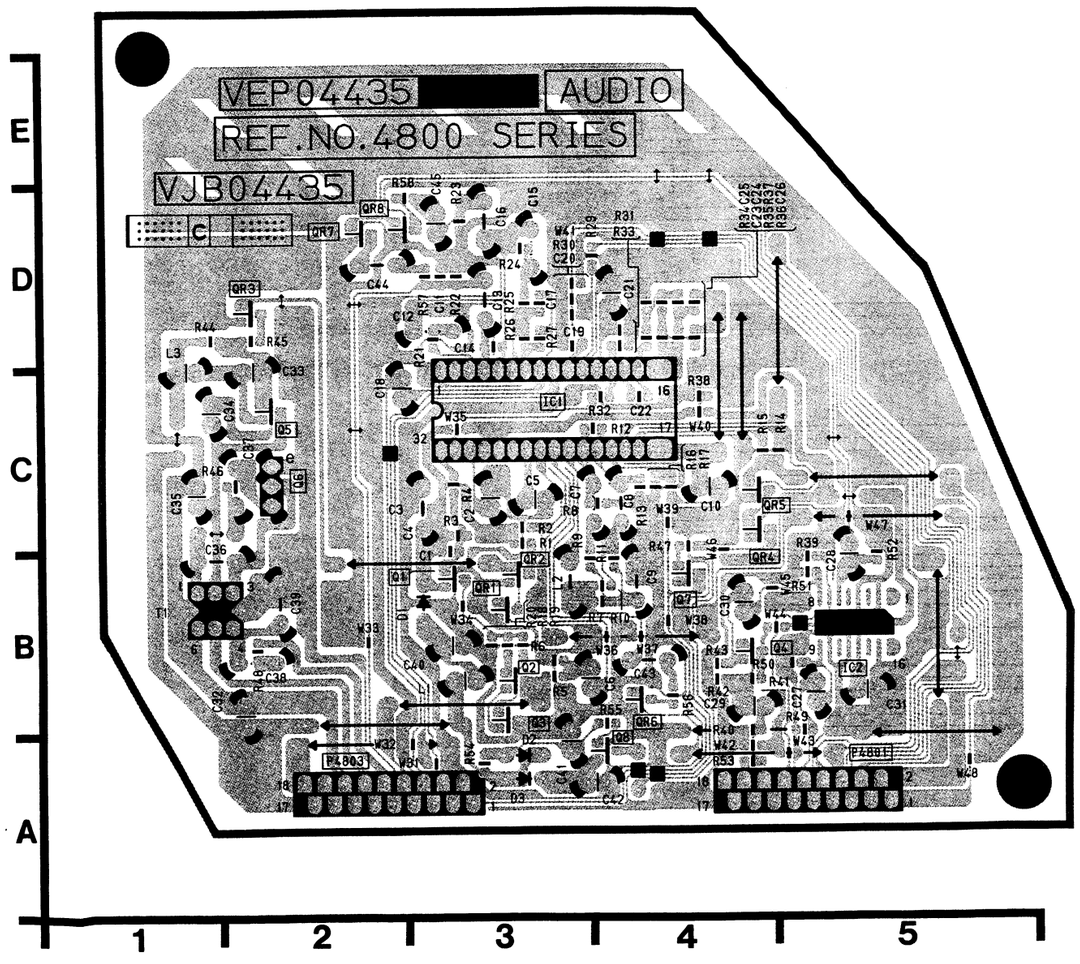
	D183
TP4006	
TP4007	
VR4002	
VR4003	
VR4004	
VR4005	

12 13 14 15 16 17 18 19 20 21 22 23

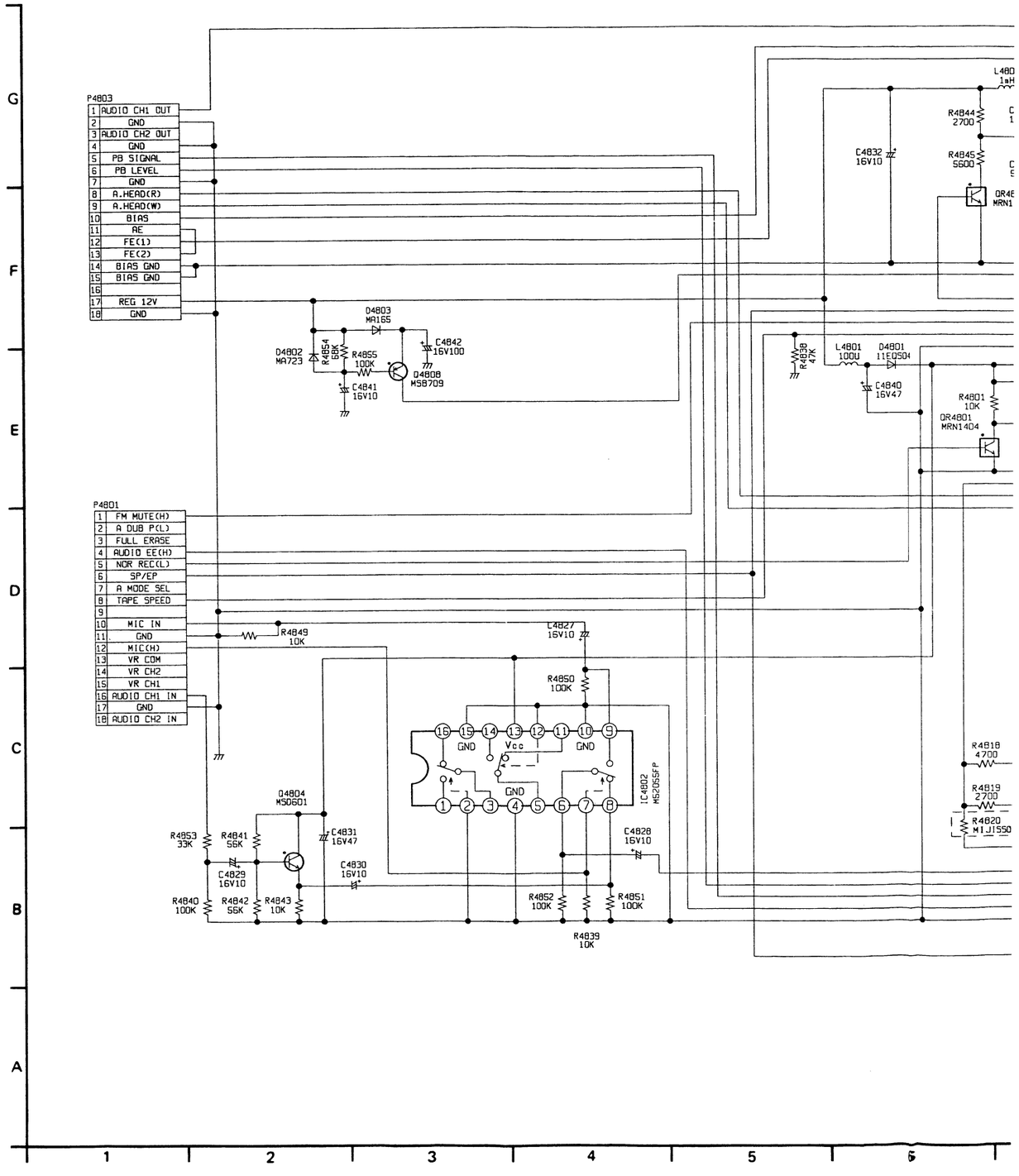
6-8. AUDIO C.B.A. (VEP04435A)

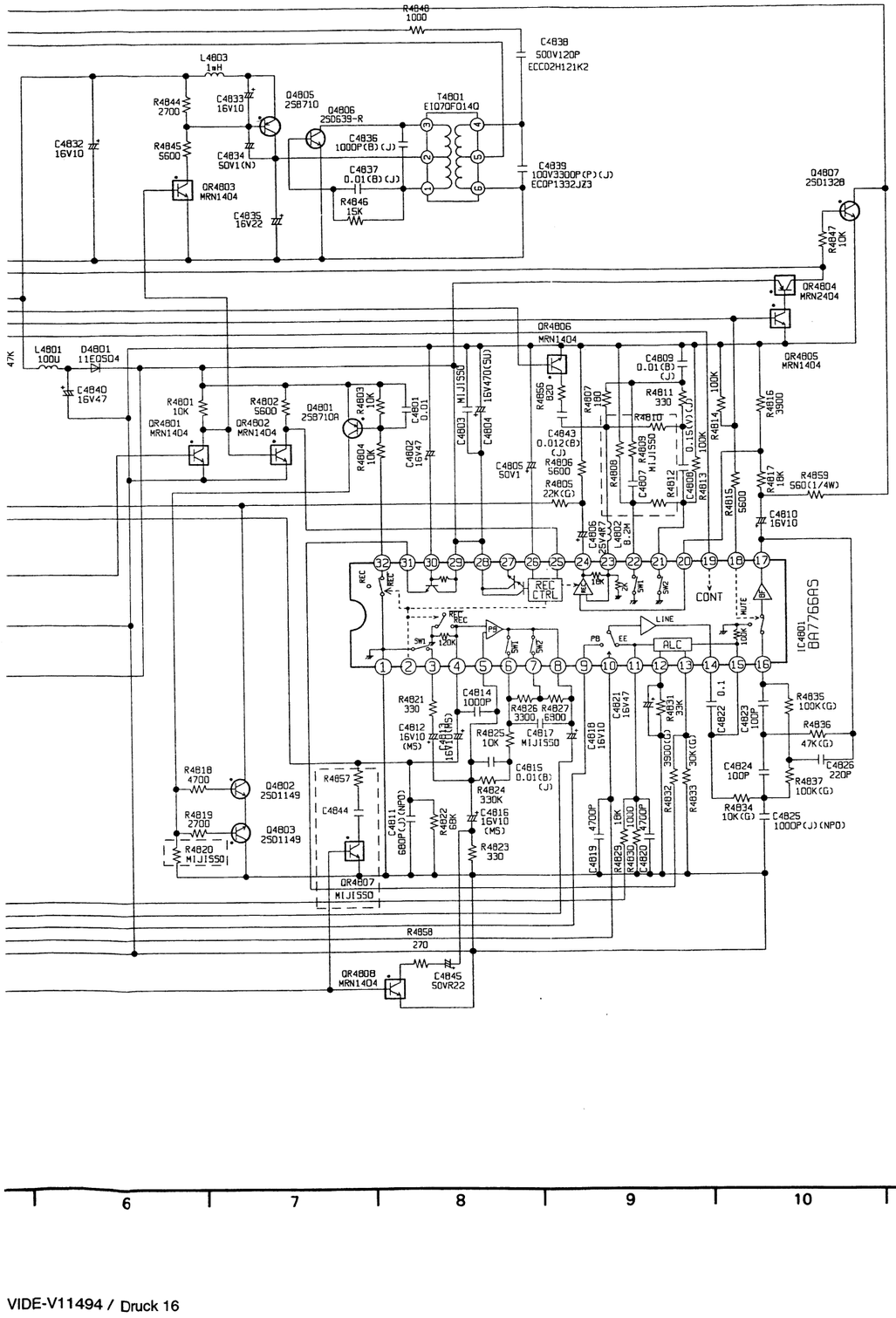
AUDIO			
TRANSISTOR		QR4805	C-4
Q4801	C-3	QR4806	B-4
Q4802	C-3	QR4807	D-2
Q4803	C-3	QR4808	D-2
Q4804	B-4	**INTEGRATED CIRCUITS**	
Q4805	C-2	IC4801	C-3
Q4806	C-2	IC4802	B-5
Q4807	B-4	**CONNECTOR**	
Q4808	A-4	P4801	A-5
TRANSISTOR RESISTOR		P4803	A-2
QR4801	C-3		
QR4802	C-3		
QR4803	D-2		
QR4804	C-4		

ADDRESS INFORMATION

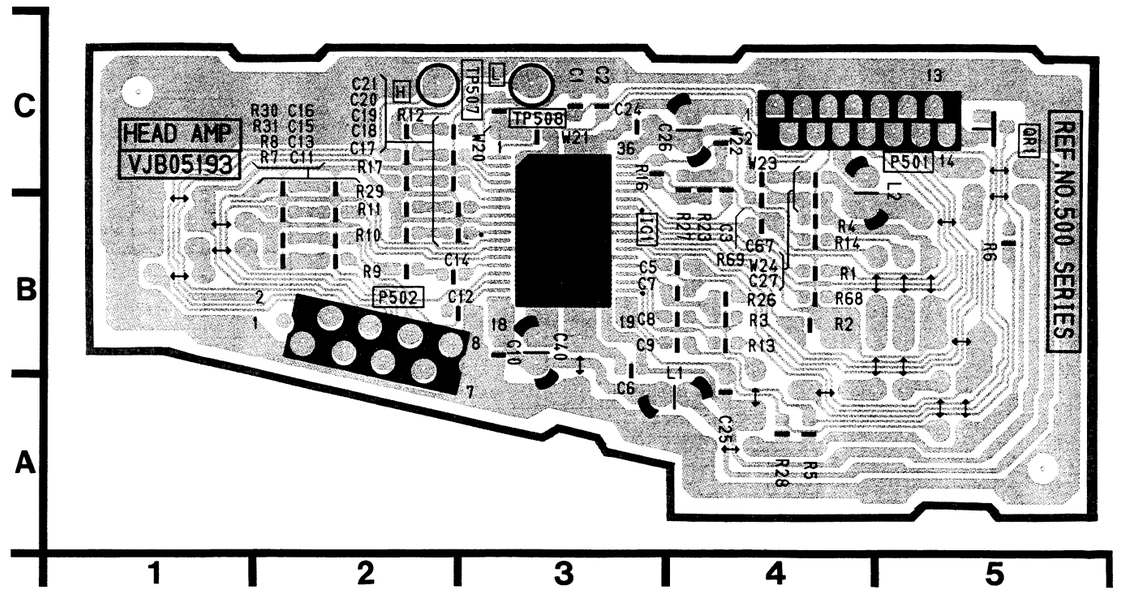


6-9. AUDIO SCHEMATIC DIAGRAM





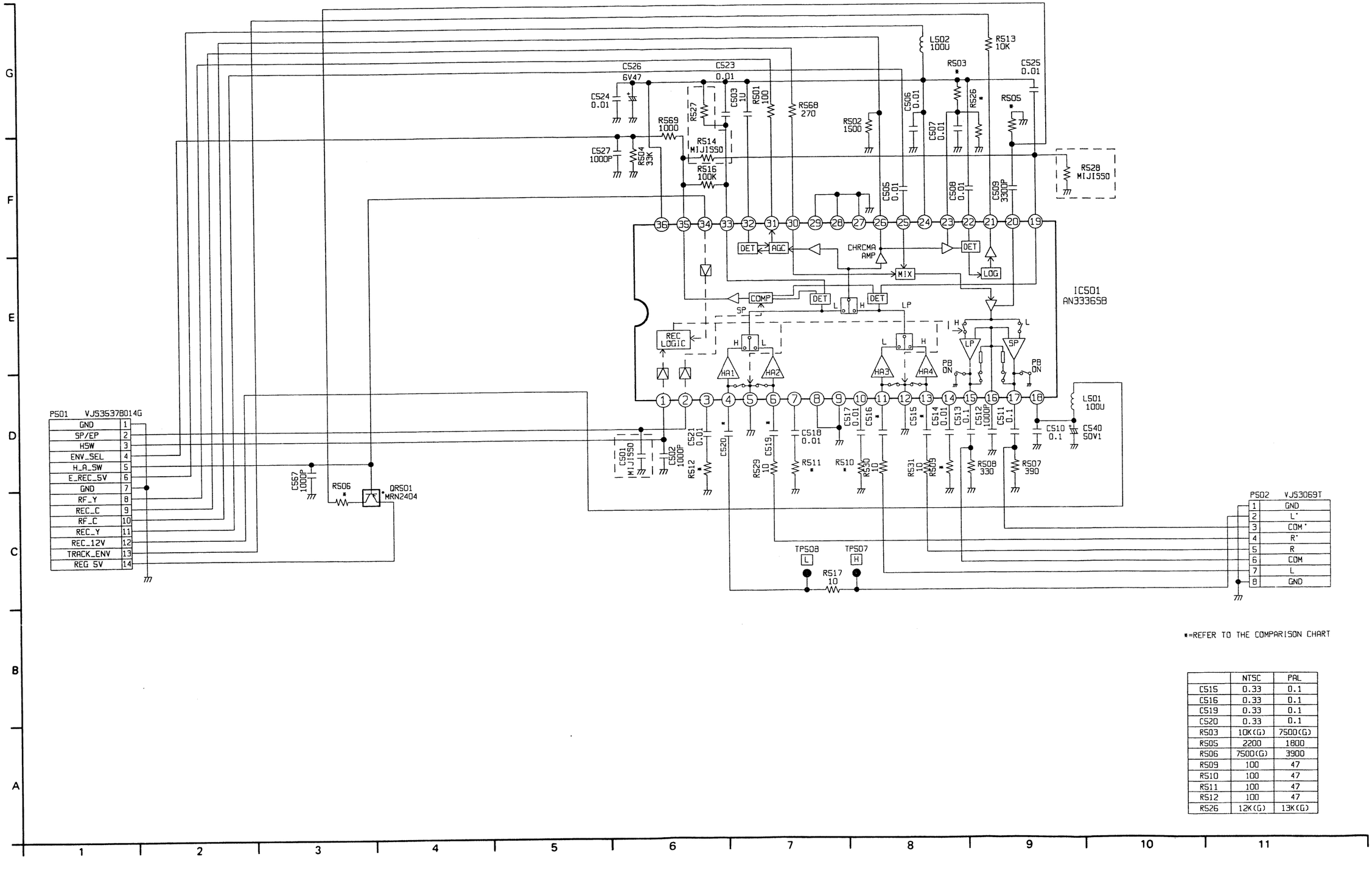
6-10. HEAD AMP PACK C.B.A. (VEP05193A)



HEAD AMP PACK	
TRANSISTOR RESISTOR	
QR501	C-5
INTEGRATED CIRCUITS	
IC501	B-3
TEST POINT	
TP507 TP508	C-2 C-3
CONNECTOR	
P501 P502	C-4 B-2

ADDRESS INFORMATION

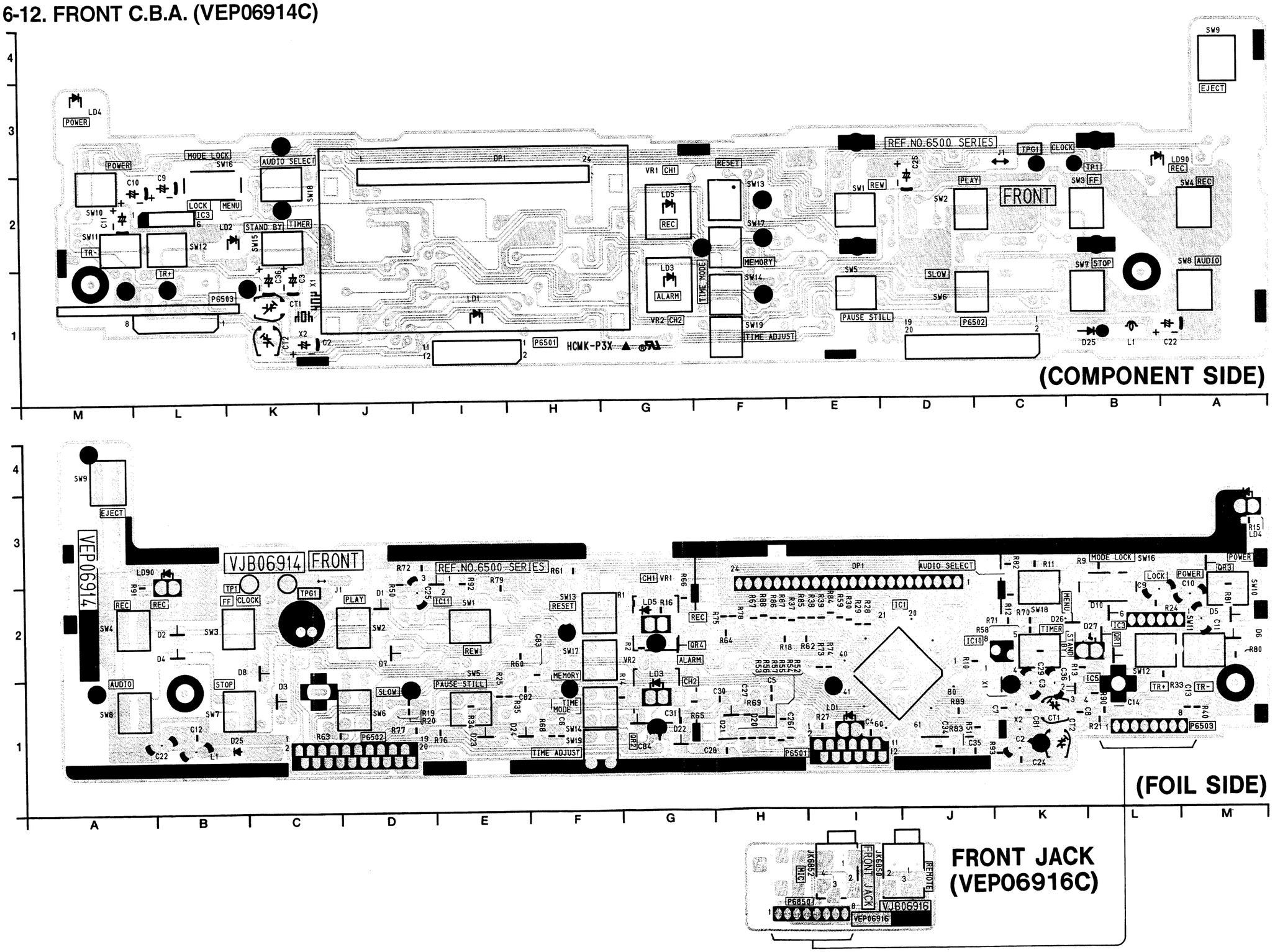
6-11. HEAD AMP PACK SCHEMATIC DIAGRAM



*=REFER TO THE COMPARISON CHART

	NTSC	PAL
C515	0.33	0.1
C516	0.33	0.1
C519	0.33	0.1
C520	0.33	0.1
R503	10K(G)	7500(G)
R505	2200	1800
R506	7500(G)	3900
R509	100	47
R510	100	47
R511	100	47
R512	100	47
R526	12K(G)	13K(G)

6-12. FRONT C.B.A. (VEP06914C)



6-13. FRONT & FRONT JACK SCHEMATIC DIAGRAM

FRONT(VEP06914E)			
COMPONENT SIDE		**FOIL SIDE**	
INTEGRATED CIRCUITS		**TRANSISTOR RESISTOR**	
IC6503	L-2	QR6503	M-3
TESTPOINT		QR6504	G-2
TP6501	C-3	**INTEGRATED CIRCUITS**	
TPG6501	C-3	IC6501	I-2
CONNECTOR		IC6505	K-1
P6501	I-1	IC6510	J-2
P6502	D-1		
P6503	L-1		
ADJUSTMENT			
VR6501	G-2		
VR6502	G-1		
SWITCH			
SW6501	E-2		
SW6502	D-2		
SW6503	B-2		
SW6504	A-2		
SW6505	E-1		
SW6506	D-1		
SW6507	B-1		
SW6508	A-1		
SW6509	A-4		
SW6510	M-2		
SW6511	M-2		
SW6513	F-2		
SW6514	F-1		
SW6516	L-3		
SW6517	F-2		
SW6518	K-2		

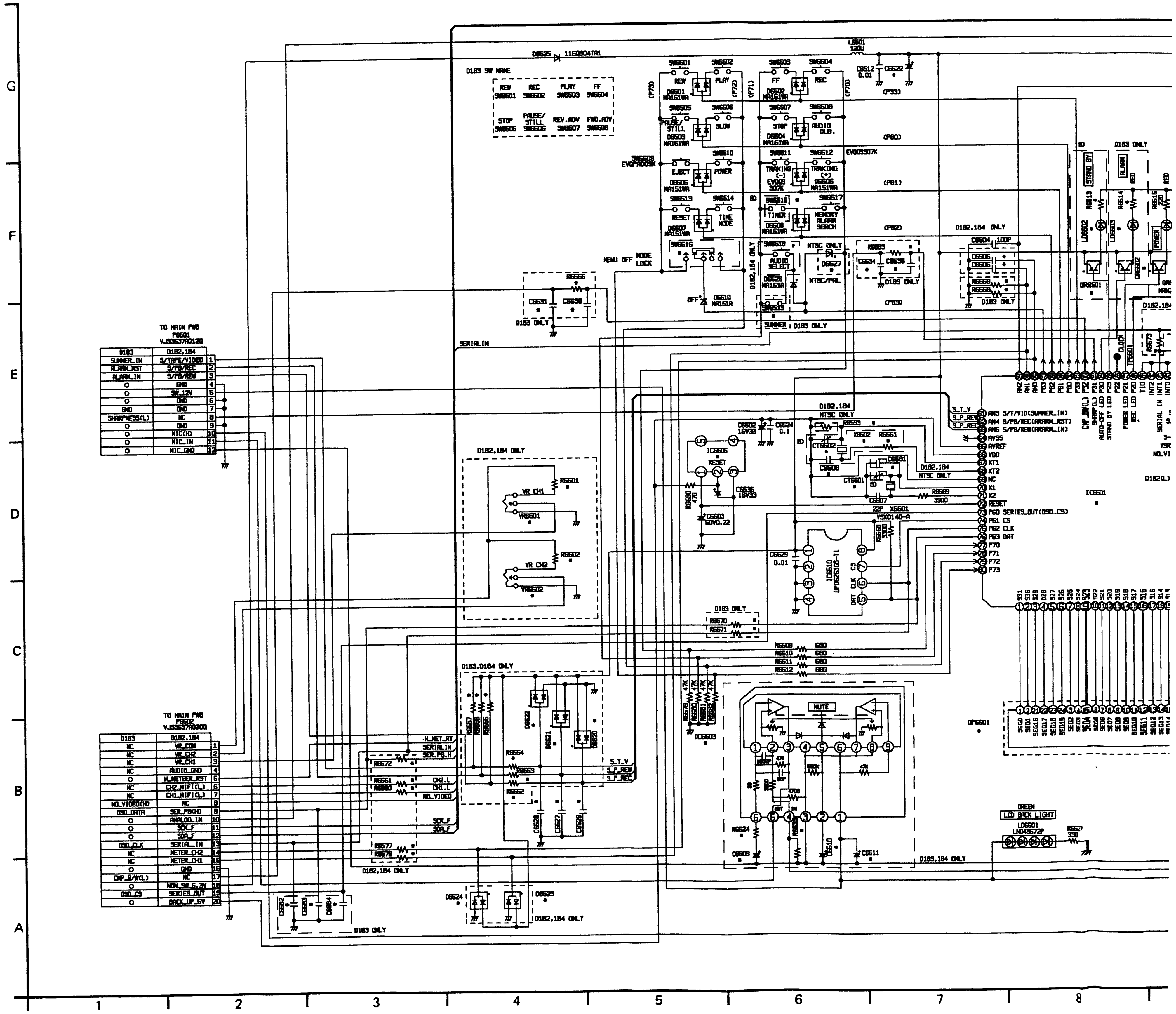
ADDRESS INFORMATION

	D183-T	D183-P	D183-E
C6505	———	———	———
C6506	———	———	———
C6508	39P	39P	39P
C6522	10V33	10V33	10V33
C6525	———	———	———
C6530	270P	270P	270P
C6531	270P	270P	270P
C6534	270P	270P	270P
C6535	270P	270P	270P
C6581	———	———	———
CT6501	30P	30P	30P
CT6502	30P	30P	30P
D6523	———	———	———
D6524	———	———	———
D6527	MA151A	MA151A	———
DP6501	ED0063Y78A4P	ED0063Y78A4P	ED0063Y78A4P
IC6501	UPD75336C100	UPD75336C100	UPD75336C079
IC6511	MN1382-RTW	MN1382-RTW	MN1382-RTW
LD6502	LN81RCPHL	LN81RCPHL	LN81RCPHL
LD6503	LN81RCPHL	LN81RCPHL	LN81RCPHL
LD6505	LN81RCPHL	LN81RCPHL	LN81RCPHL
LD6530	———	———	———
QR6501	MRN2402TE85R	MRN2402TE85R	MRN2402TE85R
QR6502	MRN2402TE85R	MRN2402TE85R	MRN2402TE85R
R6501	———	———	———

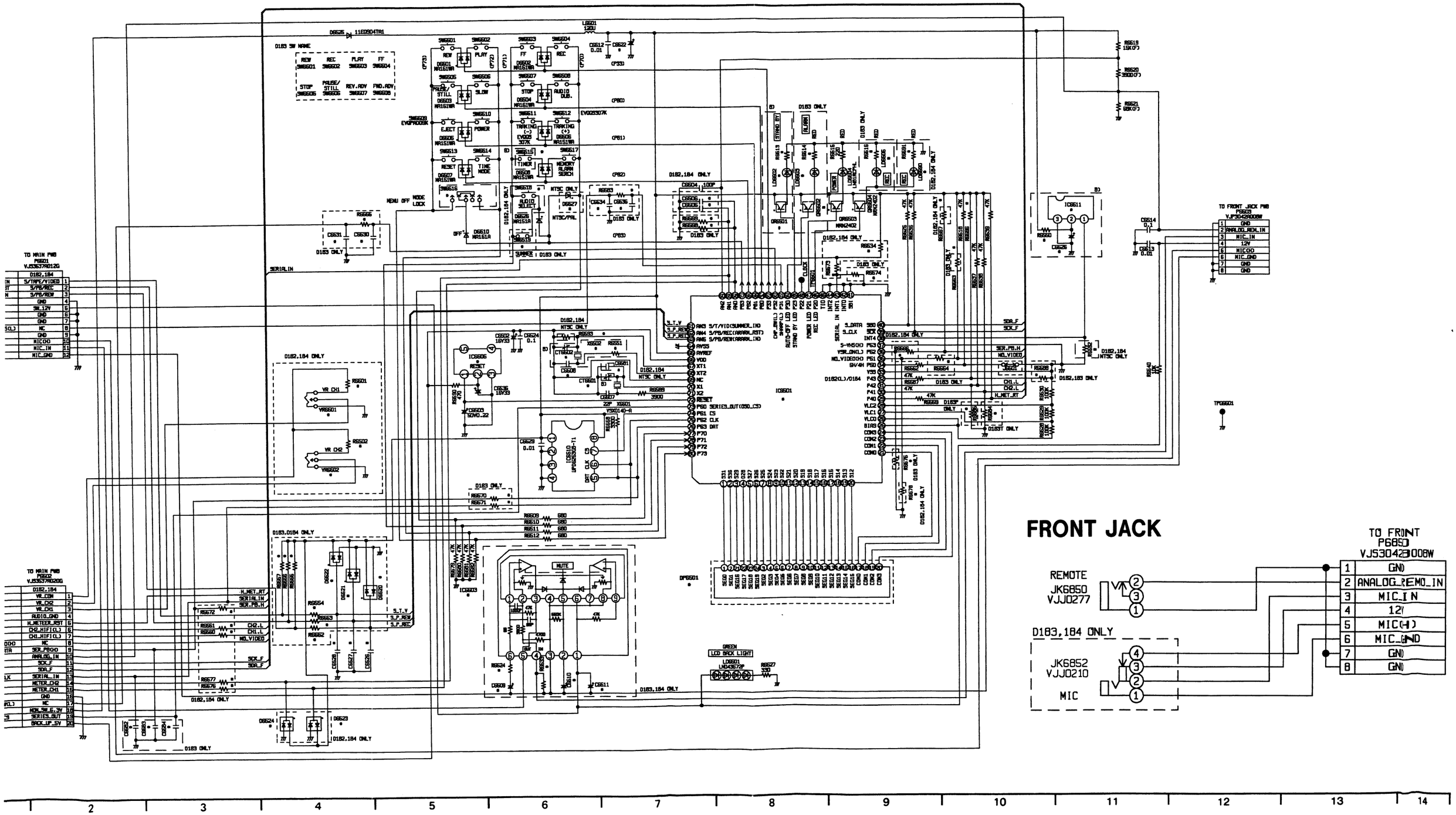
	D183-T	D183-P	D183-E
R6502	———	———	———
R6513	220	220	220
R6514	220	220	220
R6516	220	220	220
R6534	———	———	———
R6550	470	470	470
R6551	220K	220K	220K
R6555	10K	10K	10K
R6566	10K	10K	10K
R6567	10K	10K	10K
R6560	———	———	———
R6561	———	———	———
R6563	47K	47K	47K
R6564	47K	47K	47K
R6565	470	470	470
R6566	———	———	———
R6567	———	———	———
R6568	0	0	0
R6569	0	0	0
R6570	0	0	0
R6571	0	0	0
R6572	———	———	———
R6573	———	———	———
R6574	0	0	0
R6586	1000	1000	1000

	D183-T	D183-P	D183-E
IC6505	MN1382-HTX	MN1382-HTX	MN1382-HTX
R6575	0	0	0
R6576	———	———	———
R6577	———	———	———
R6578	———	———	———
R6583	470	470	470
R6584	0	———	———
R6585	———	0	———
R6588	0	0	0
R6591	———	———	———
R6592	———	———	———
R6593	———	———	———
SW6515	EVQ0S307K	EVQ0S307K	EVQ0S307K
SW6516	VSS0249	VSS0249	VSS0249
SW6518	———	———	———
SW6519	EVQ0S307K	EVQ0S307K	EVQ0S307K
VR6501	———	———	———
VR6502	———	———	———
X6502	VSX0094-C	VSX0094-C	VSX0094-C
R6524	82	82	82
R6533	680	680	680
C6509	16V33	16V33	16V33
C6510	50V3R3	50V3R3	50V3R3
C6511	16V33	16V33	16V33
IC6503	VCR0172	VCR0172	VCR0172

	D183-T	D183-P	D183-E
C6582	1000P	1000P	1000P
C6583	1000P	1000P	1000P
C6584	1000P	1000P	1000P
C6526	100P	100P	100P
C6527	100P	100P	100P
C6528	100P	100P	100P
D6520	MA153-TW	MA153-TW	MA153-TW
D6521	MA153-TW	MA153-TW	MA153-TW
D6522	MA153-TW	MA153-TW	MA153-TW
R6552	10K	10K	10K
R6553	10K	10K	10K
R6554	10K	10K	10K



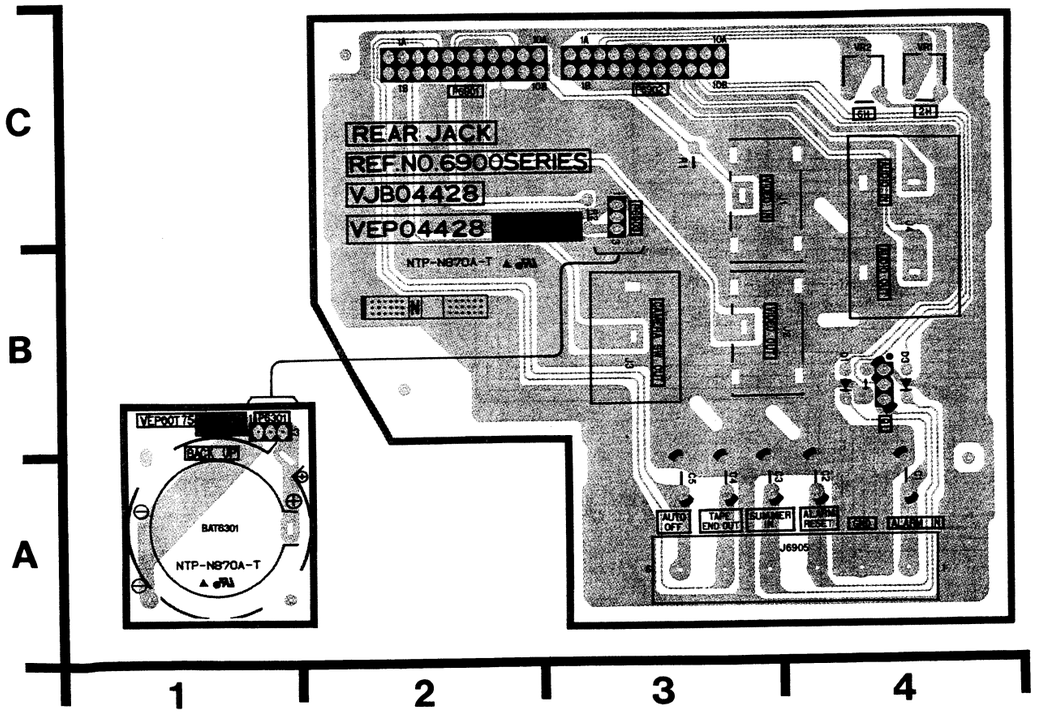
& FRONT JACK SCHEMATIC DIAGRAM



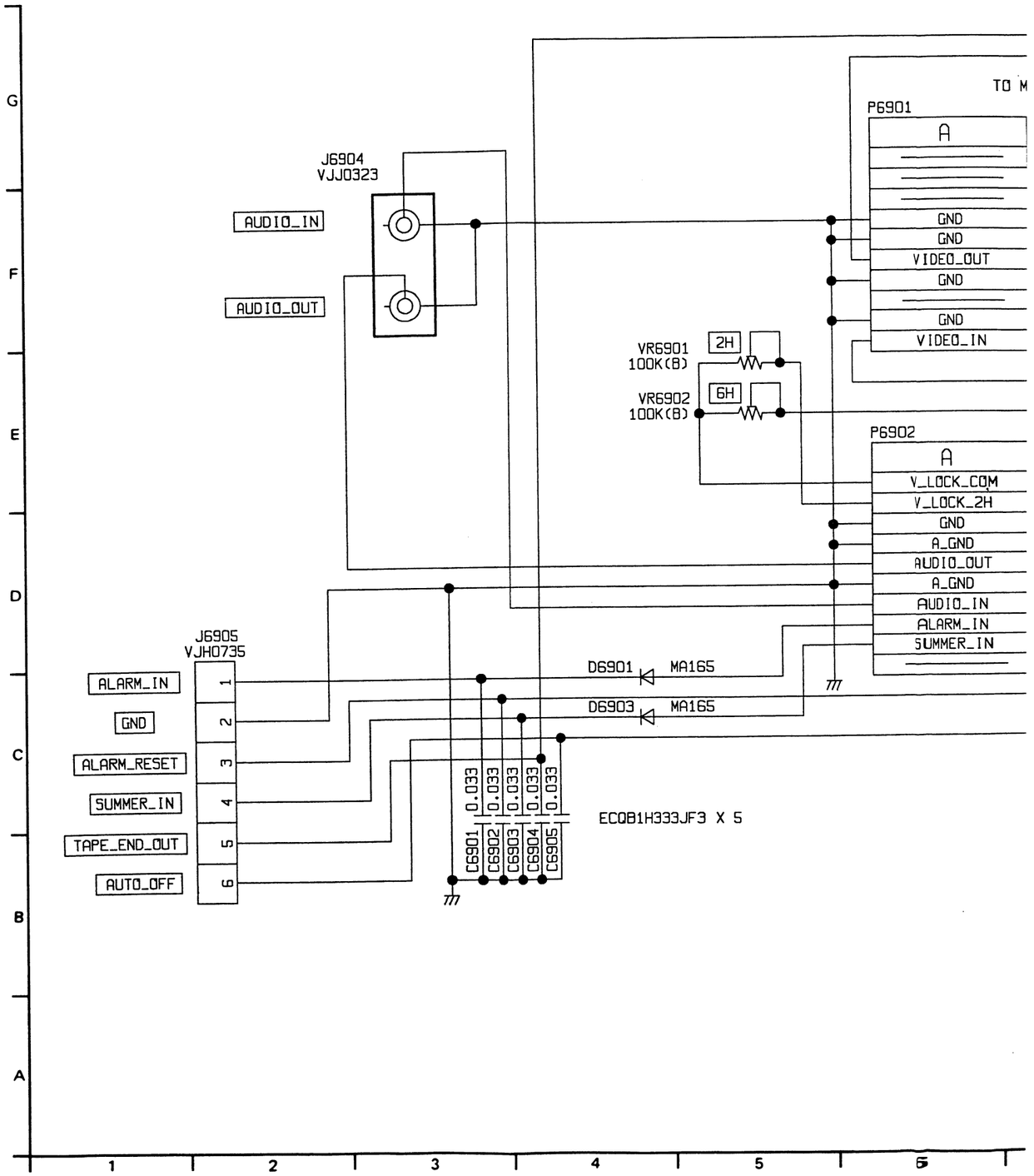
6-14. REAR JACK C.B.A. (VEP04428A)

REAR JACK PACK	
TRANSISTOR	
Q6901	B-4
ADJUSTMENT	
VR6901 VR6902	C-4 C-4
CONNECTOR	
P6301 P6901 P6902 P6903	B-1 C-2 C-3 C-3

ADDRESS INFORMATION



6-15. REAR JACK SCHEMATIC DIAGRAM



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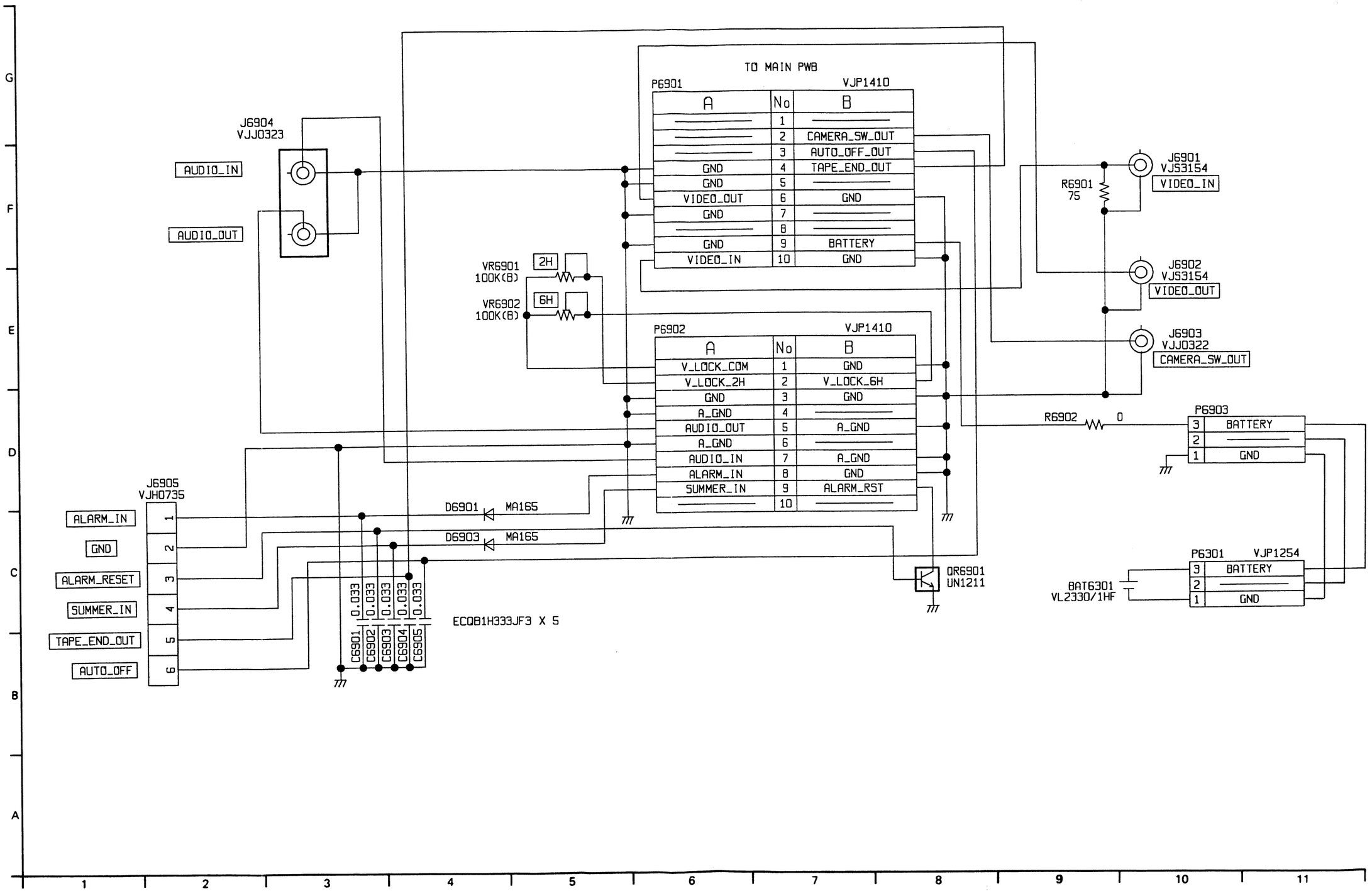
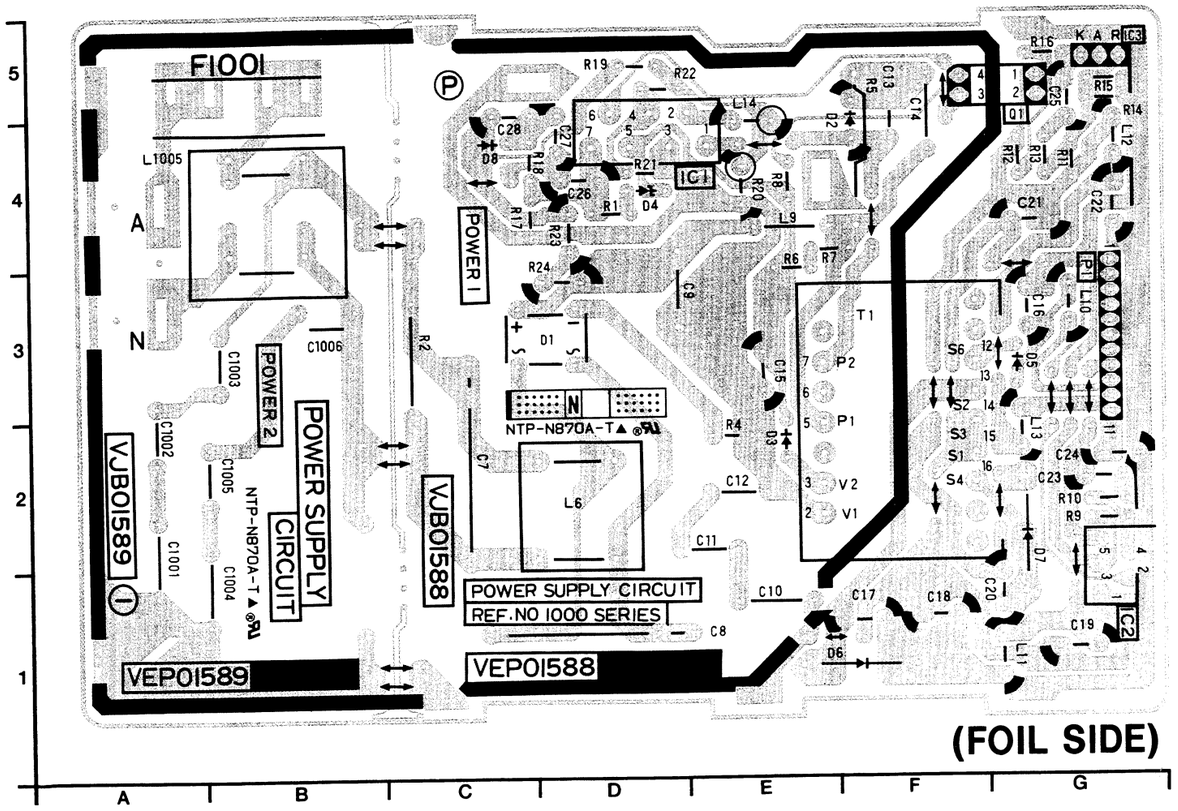
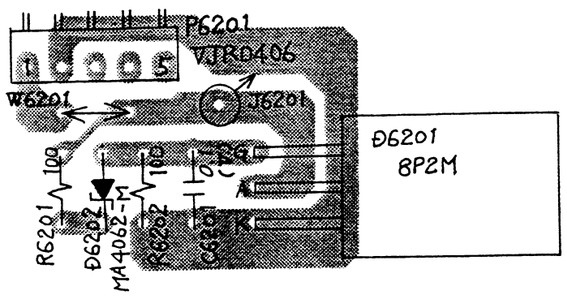
6-15. REAR JACK SCHEMATIC DIAGRAM



6-16. POWER 1 C.B.A. (VEP01588A)
POWER 2 C.B.A. (VEP01589B)



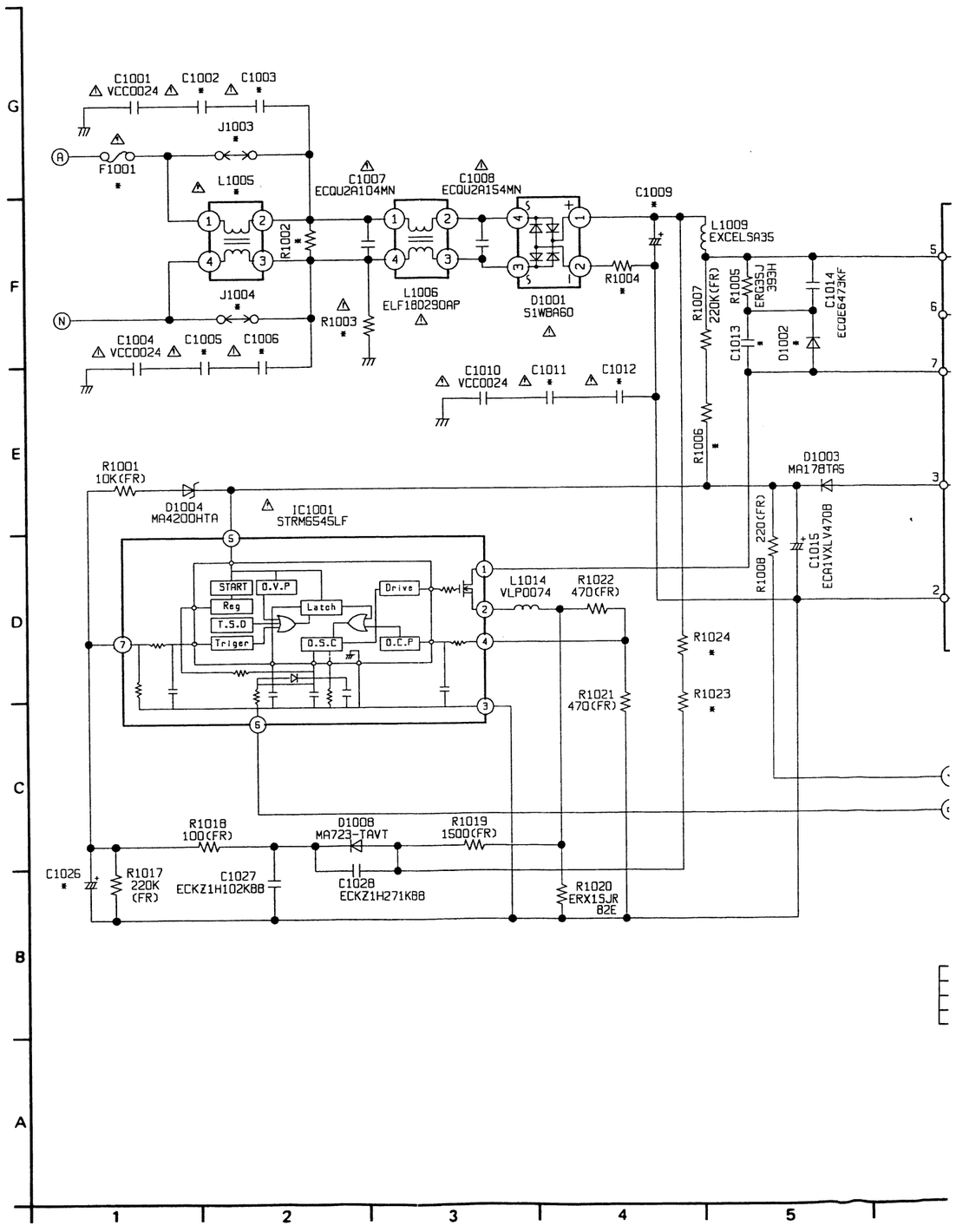
POWER SUB C.B.A. (VEP06974A)



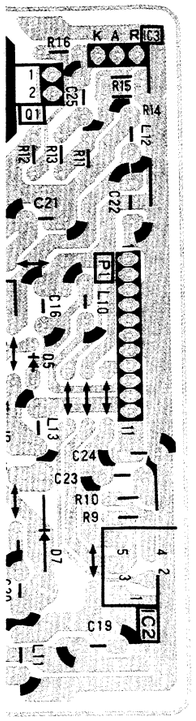
POWER 1(VEP01588B) POWER 2(VEP01589A)	
FOIL SIDE	
TRANSISTOR	
Q1001	G-5
INTEGRATED CIRCUITS	
IC1001	D-4
IC1002	G-1
IC1003	G-5
CONNECTOR	
P1001	G-3

ADDRESS INFORMATION

6-17. POWER SCHEMATIC DIAGRAM



6-17. POWER SCHEMATIC DIAGRAM



OIL SIDE)

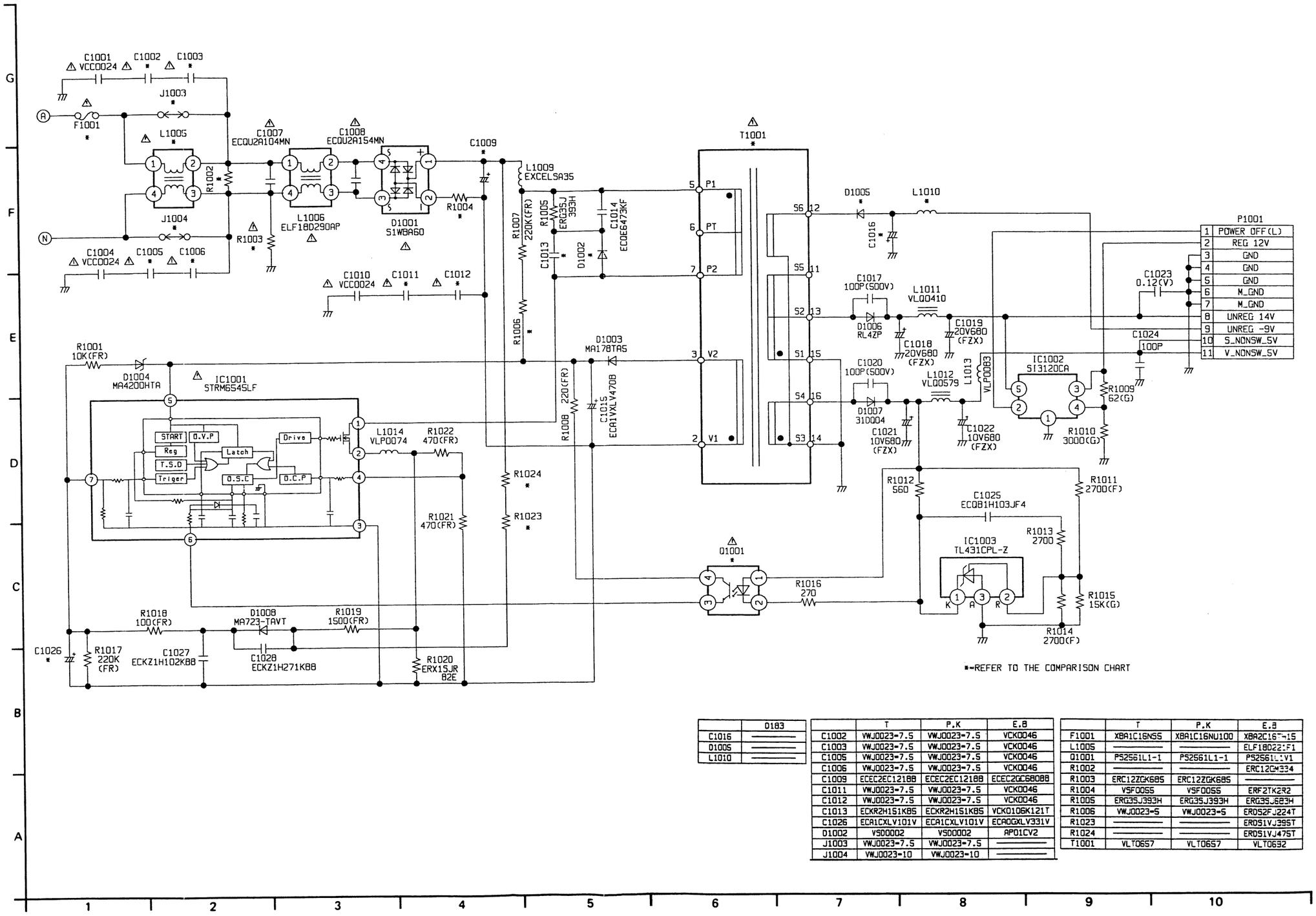
G

588B)
589A)

R
G-5

CUITS
D-4
G-1
G-5

R
G-3



*-REFER TO THE COMPARISON CHART

	D183
C1016	———
D1005	———
L1010	———

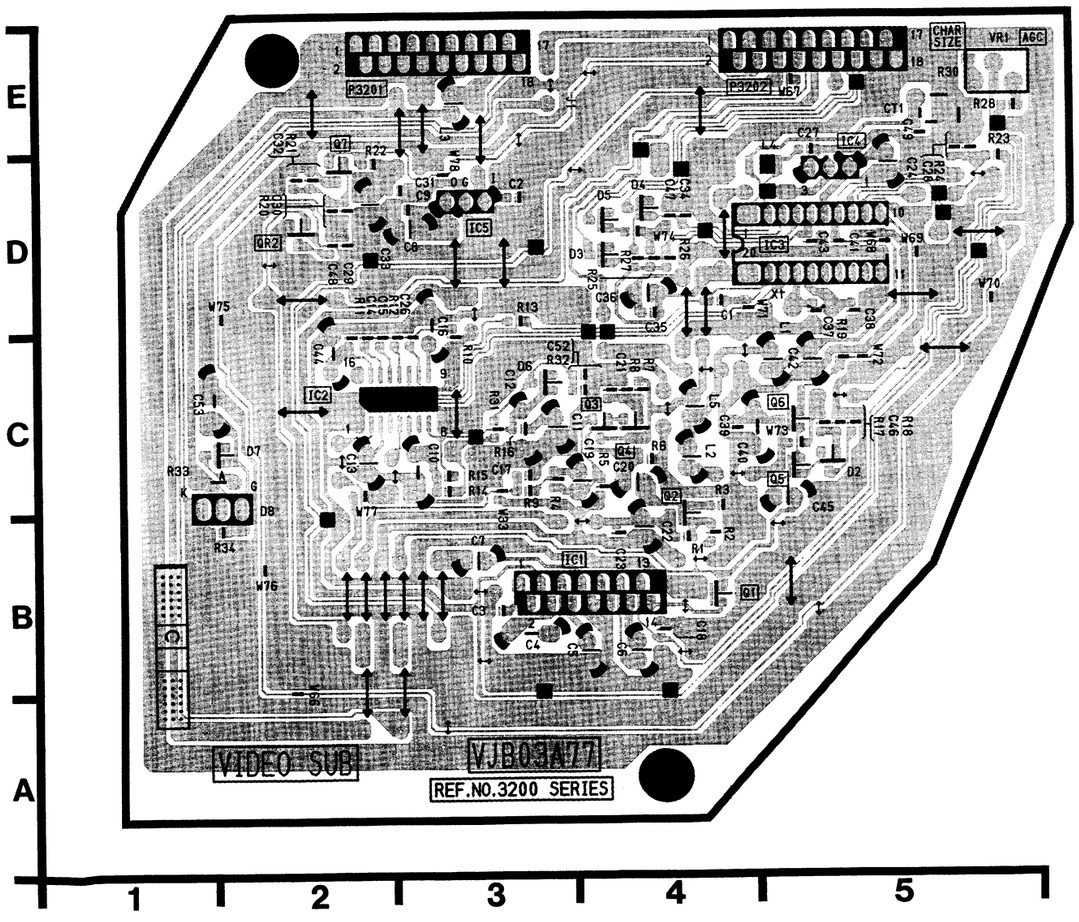
	T	P.K	E.B
C1002	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1003	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1005	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1006	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1009	ECEC2EC1218B	ECEC2EC1218B	ECEC2GC6808B
C1011	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1012	VWJ0023-7.5	VWJ0023-7.5	VCK0046
C1013	ECKR2H151KB5	ECKR2H151KB5	VCK0106K121T
C1026	ECA1CXLV101V	ECA1CXLV101V	ECA0GXLV331V
D1002	VSD0002	VSD0002	APD1CV2
J1003	VWJ0023-7.5	VWJ0023-7.5	———
J1004	VWJ0023-10	VWJ0023-10	———

	T	P.K	E.B
F1001	XBA1C16N55	XBA1C16NU100	XBA2C16[illegible]15
L1005	———	———	ELF18D22[illegible]F1
Q1001	PS2561L1-1	PS2561L1-1	PS2561L[illegible]V1
R1002	———	———	ERC12GH334
R1003	ERC12ZGK685	ERC12ZGK685	———
R1004	V5F0055	V5F0055	ERF2TK2R2
R1005	ERG35J393H	ERG35J393H	ERG35J683H
R1006	VWJ0023-5	VWJ0023-5	ERD52FJ224T
R1023	———	———	ERD51VJ395T
R1024	———	———	ERD51VJ475T
T1001	VLT0657	VLT0657	VLT0692

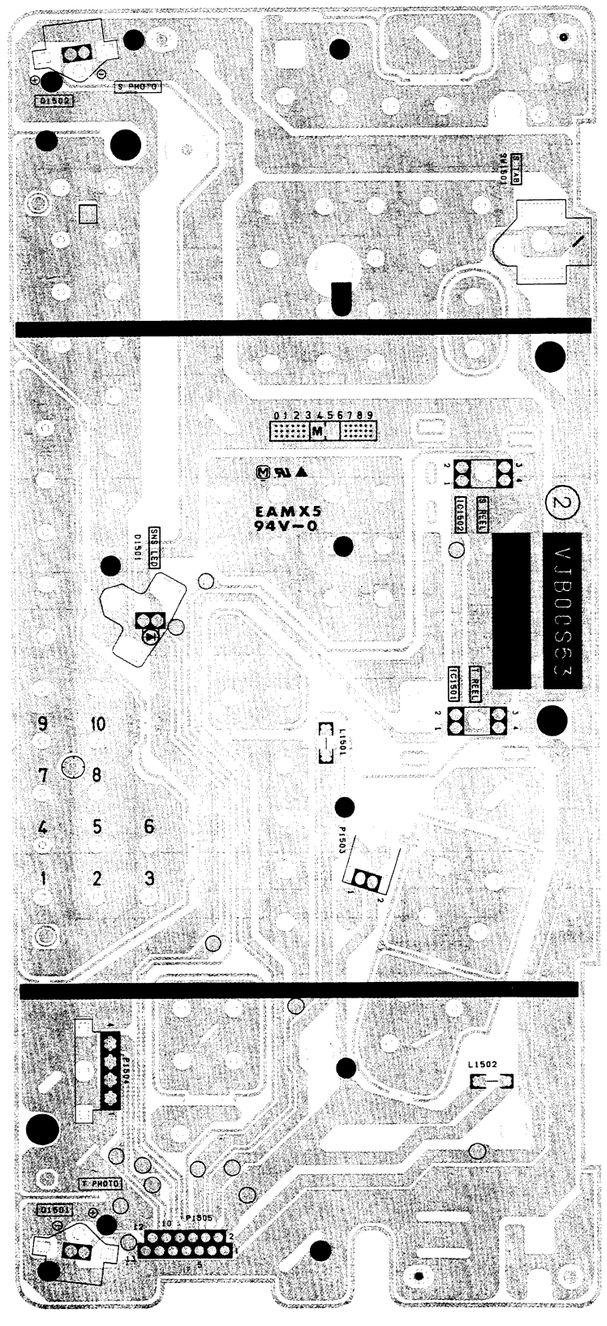
6-18. VIDEO SUB C.B.A. (VEP03A77A)

VIDEO SUB MAIN			
COMPONENT SIDE		FOIL SIDE	
TRANSISTOR		INTEGRATED CIRCUITS	
Q3201	B-4	IC3202	C-2
Q3202	C-4	IC3203	D-4
Q3203	C-4	IC3204	D-5
Q3204	C-4	IC3205	D-3
Q3205	C-5	ADJUSTMENT	
Q3206	C-5	VR3201	E-5
Q3207	D-2	CT3201	E-5
TRANSISTOR RESISTOR		CONNECTOR	
QR3202	D-2	P3201	E-2
INTEGRATED CIRCUITS		P3202	E-4
IC3201	B-2		

ADDRESS INFORMATION



6-19. MECHANISM CONNECTION C.B.A. (VEP00S63C)



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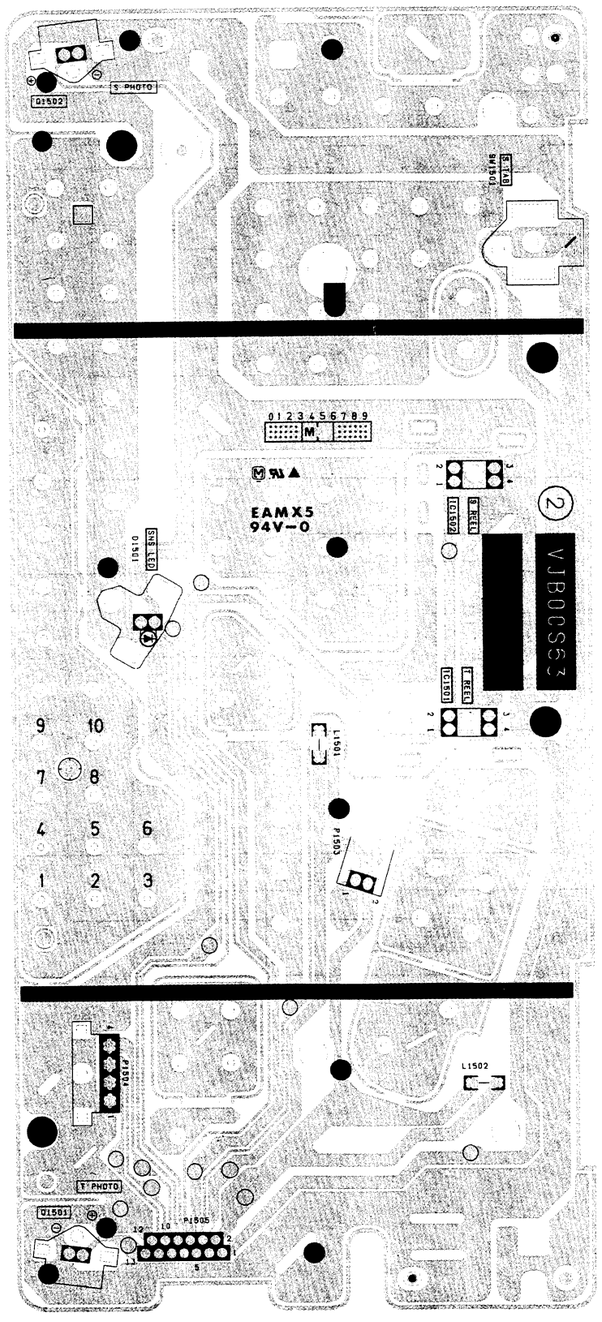
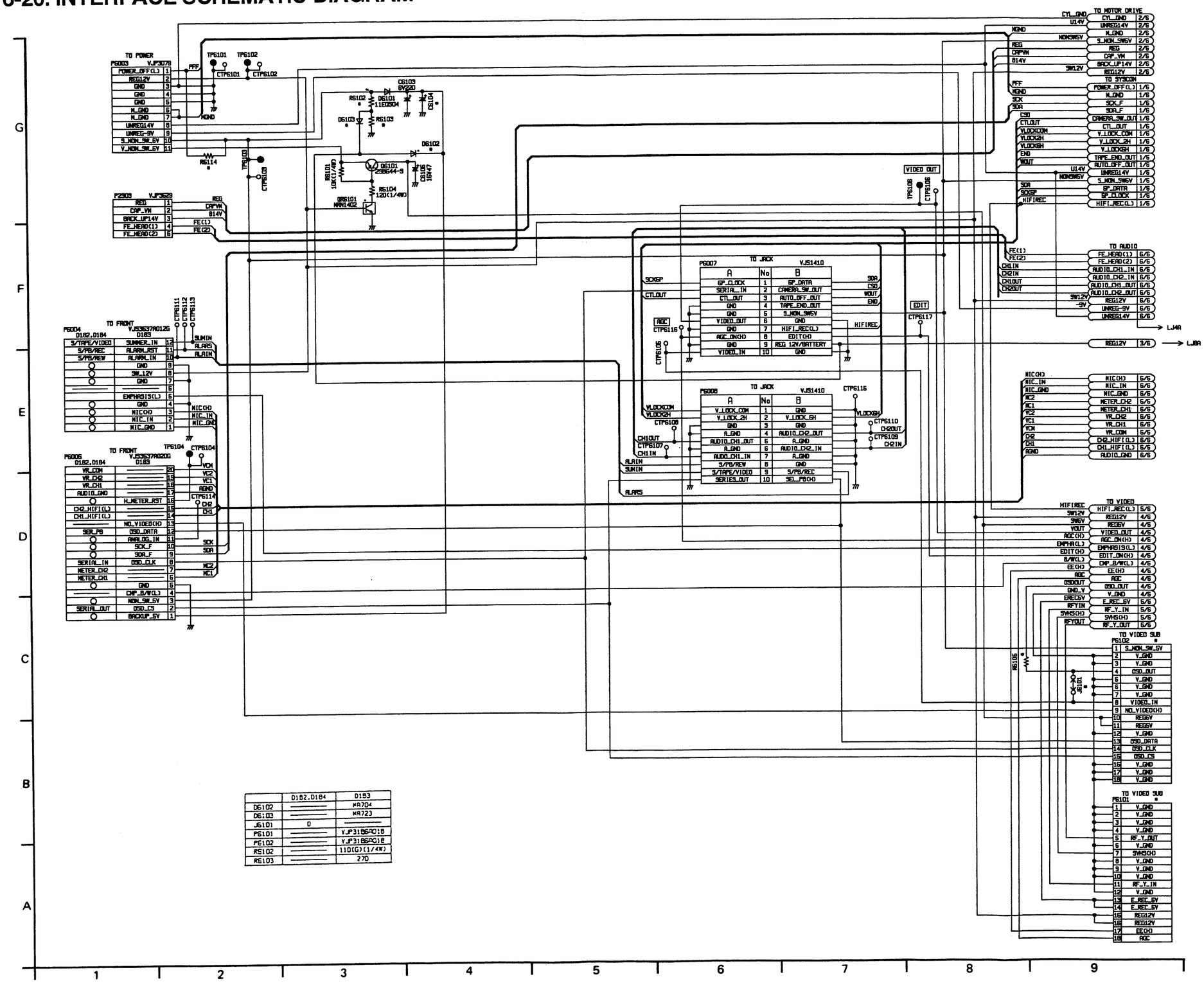
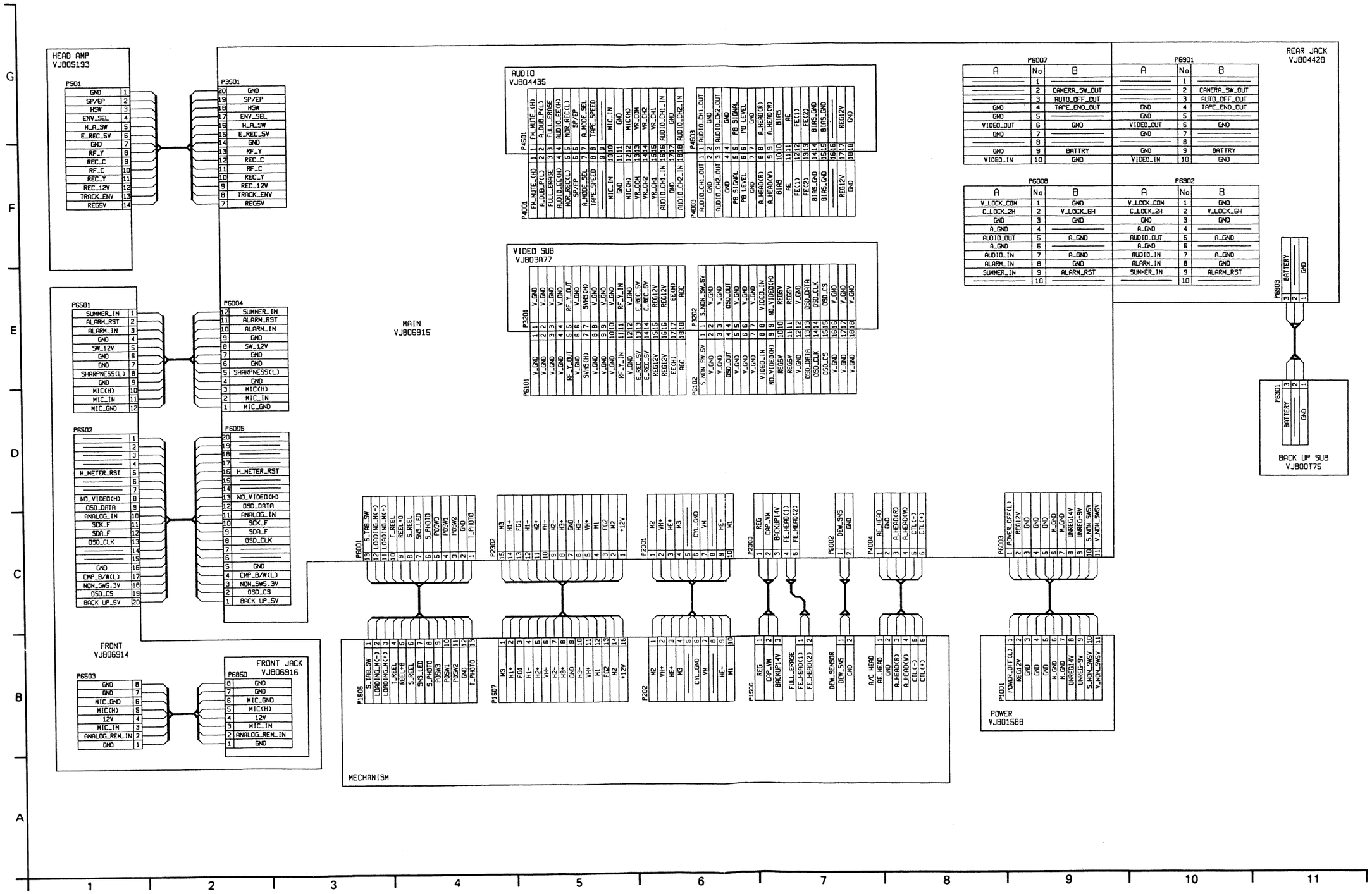
6-19. MECHANISM CONNECTION C.B.A. (VEP00S63C)



6-20. INTERFACE SCHEMATIC DIAGRAM



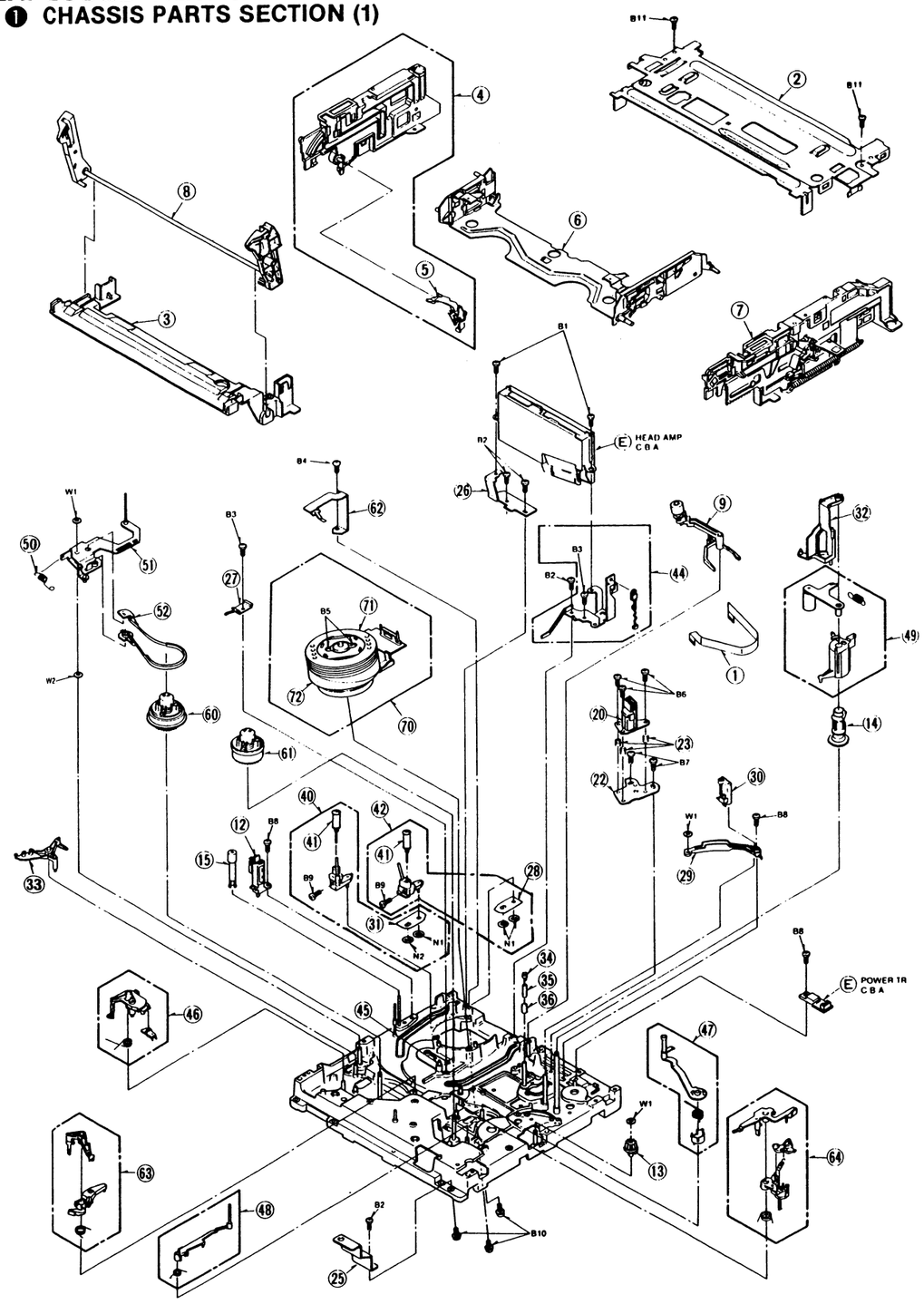
6-21. INTER CONNECTION SCHEMATIC DIAGRAM



7-1. EXPLODED VIEW & MECHANICAL REPLACEMENT PARTS LIST

EXPLODED VIEW & MECHANICAL REPLACEMENT PARTS LIST

❶ CHASSIS PARTS SECTION (1)



PARTS — 1

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1(1)	VWJ0653	FLEXIBLE CABLE (6P)	1	
2(1)	VMA8644	TOP PLATE	1	
3(1)	VMA8787	CASSETTE GUIDE	1	
4(1)	VXA4660	SIDE PLATE (L) UNIT	1	
5(1)	VXL2250	OPENER LEVER UNIT	1	
6(1)	VXA4661	CASSETTE HOLDER PLATE UNIT	1	
7(1)	VXA4806	SIDE PLATE (R) UNIT	1	
8(1)	VXP1339	MAIN SHAFT UNIT	1	
9(1)	VXL2251	CLEANER ARM UNIT	1	
10(1)	VXP1366	CLEANER ROLLER UNIT	1	
12(1)	VBS0050	FE HEAD	1	
13(1)	VDG0871	CARRIAGE CONNECTION GEAR	1	
14(1)	VDG0886	PINCH CAM GEAR	1	
15(1)	VXP1402	IMPEDANCE ROLLER UNIT	1	
20(1)	VED0205	A/C HEAD (1) UNIT	1	
22(1)	VMA8624	A/C HEAD BASE	1	
23(1)	VMB2515	A/C HEAD SPRING	3	
25(1)	VMA8761	MOUNT ANGLE	1	
26(1)	VMA8763	HEAD AMP MOUNT ANGLE (L)	1	
27(1)	VMC0917	EARTH SPRING	1	
28(1)	VMA8874	INCLIND BASE HOLDER (S)	1	
29(1)	VMD2078	P5 STOPPER BASE	1	
30(1)	VXA4927	P5 POST STOPPER	1	
31(1)	VMA8873	INCLIND BASE HOLDER (T)	1	
32(1)	VMD2101	OPENER PIECE	1	
33(1)	VML2776	TENSION SPRING ARM	1	
34(1)	VMX1544	P4 UPPER LIMITER	1	
35(1)	VMX2175	P4 SLEEVE	1	
36(1)	VMX2176	P4 LOWER LIMITER	1	
40(1)	VXA4982KIT	INCLIND BASE (S) UNIT	1	
41(1)	VXP1415	ROLLER POST (S)	1	
42(1)	VXA4984KIT	INCLIND BASE (T) UNIT	1	
44(1)	VXA4869	HEAD AMP MOUNT ANGLE (R) U.	1	
45(1)	VMS5383	CASSETTE POSITION FIXTURE	1	
46(1)	VXL2310	REVIEW ARM UNIT	1	
47(1)	VXL2306	P5 ARM UNIT	1	
48(1)	VXL2243	TAKE UP TENSION REGULATOR ARM UNIT	1	
49(1)	VXL2246	PINCH ARM UNIT	1	
50(1)	VMB2434	TENSION SPRING	1	
51(1)	VXL2309	TENSION ARM (1) UNIT	1	
52(1)	VXZ0310	TENSION BAND UNIT	1	
60(1)	VXR0221	SUPPLY REEL TABLE UNIT	1	
61(1)	VXR0222	TAKE UP REEL TABLE UNIT	1	
62(1)	VXS0114	EARTH PLATE	1	
63(1)	VXZ0312	SUPPLY BRAKE ARM UNIT	1	
64(1)	VXZ0313	TAKE UP BRAKE ARM UNIT	1	
70(1)	VEG1138	CYLINDER UNIT	1	
71(1)	VEH0656	UPPER CYLINDER UNIT	1	
72(1)	VJR0082	RT TERMINAL	1	
B1	VHD0773	SCREW	2	
B2	XTV26+6F	SCREW	4	
B3	XTV26+4F	SCREW	2	
B4	XTN3+6FFZ	SCREW	1	
B5	VHD0425	SCREW	2	
B6	VHD0762	SCREW	3	
B7	XTV26+6FZ	SCREW	2	
B8	XTV26+8F	SCREW	3	
B9	VHD0760	SCREW	2	
B10	VHD0342	SCREW	3	
N1	VHN0192	NUT	3	
N2	VHN0193	NUT	1	
W1	VMX2208	WASHER	3	
W2	XWGV26D5G	WASHER	1	

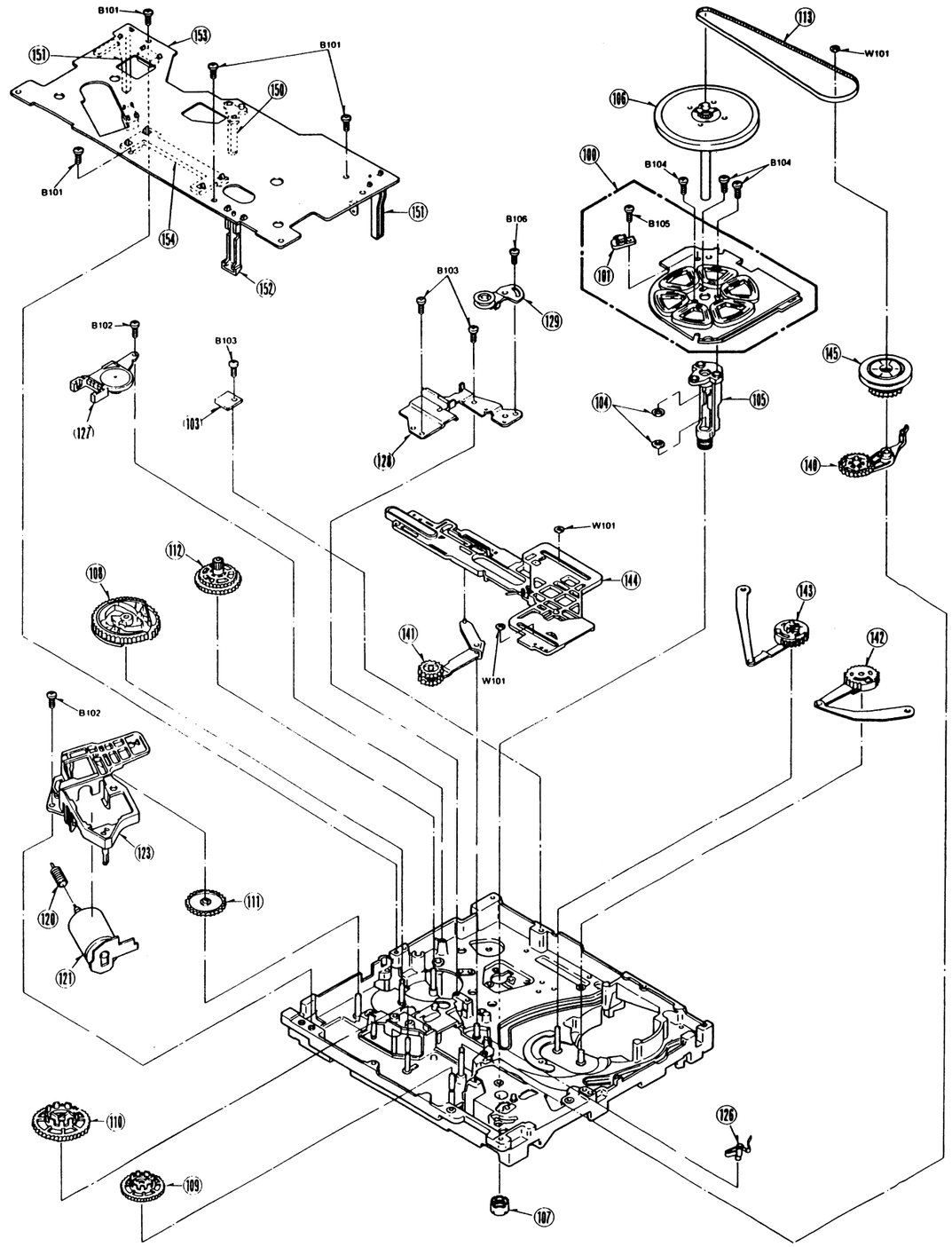
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100(2)	VEK5927	STATOR UNIT	1	
101(2)	VBK0061	FG HEAD	1	
103(2)	VMA8765	ROTOR STOPPER	1	
104(2)	VMX1927	OIL SEAL	2	
105(2)	VXD0140	HOUSING UNIT	1	
106(2)	VXP1471	ROTOR UNIT	1	
107(2)	VXQ0297	THRUST SCREW UNIT	1	
108(2)	VDG0913	MAIN CAM GEAR	1	
109(2)	VDG0861	SUPPLY REEL GEAR	1	
110(2)	VDG0862	TAKE UP REEL GEAR	1	
111(2)	VDG0868	WORM WHEEL GEAR	1	
112(2)	VDG0885	SUB CAM GEAR	1	
113(2)	VDV0235	TIMING BELT	1	
120(2)	VDG0866	WORM GEAR	1	
121(2)	VEM0427	LOADING MOTOR (1) UNIT	1	
123(2)	VMD1942	MOTOR BRACKET	1	
126(2)	VML2725	IDLER CONTROL LEVER	1	
127(2)	VSS0365	MODE SW	1	
128(2)	VMA8965	SS BRAKE BASE UNIT	1	
129(2)	VXA4799	TENSION ROLLER UNIT	1	
140(2)	VXL2229	IDLER ARM UNIT	1	
141(2)	VXL2230	DIRECT LEVER UNIT	1	
142(2)	VXL2299	SUPPLY LOADING ARM UNIT	1	
143(2)	VXL2300	TAKE UP LOADING ARM UNIT	1	
144(2)	VXL2307	MAIN LEVER UNIT	1	
145(2)	VXP1409	CENTRE CLUTCH	1	
150(2)	VMD1926	LED HOLDER	1	
151(2)	VMD1927	PHOTO TRANSISTOR HOLDER	2	
152(2)	VES0695	SAFETY TAB SW	1	
153(2)	VJB00S63	MECHANISM CONNECTION C.B.	1	ELECTRICAL PARTS ON THE C.B.A.IS LISTED ON ELECTRICAL PARTS LIST.
154(2)	VMD2029	REEL SHAFT GUIDE	1	
B101	VHD0772	SCREW	4	
B102	XTV26+8F	SCREW	2	
B103	XTV26+6F	SCREW	3	
B104	VHD0753	SCREW	3	
B105	VHD0754	SCREW	1	
B106	XSB26+4FZ	SCREW	1	
W101	VMX2208	WASHER	3	

PARTS — 2

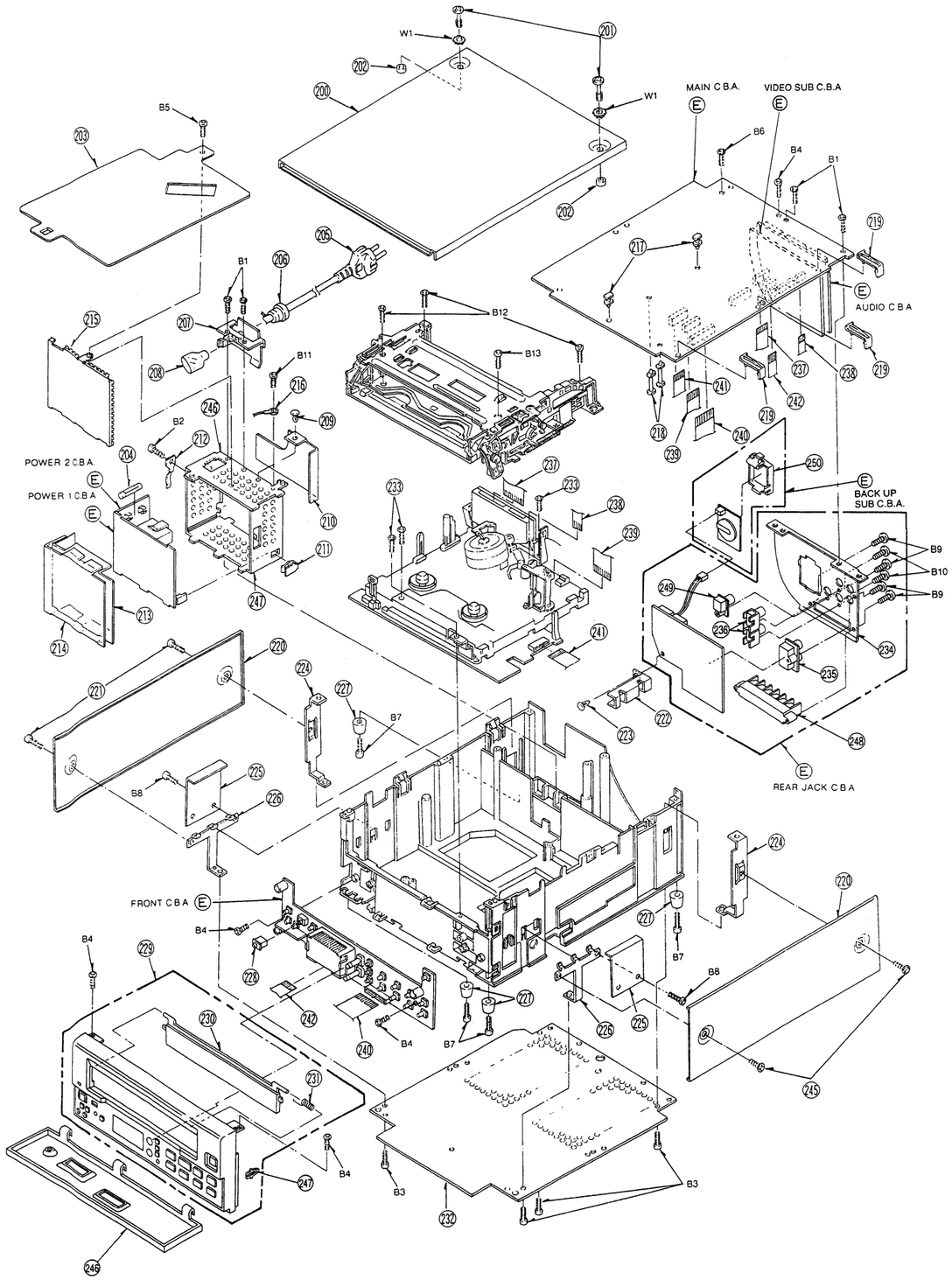
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1(1)	VMJ0653	FLEXIBLE CABLE (6P)	1	
2(1)	VMA8644	TOP PLATE	1	
3(1)	VMA8787	CASSETTE GUIDE	1	
4(1)	VXA4660	SIDE PLATE (L) UNIT	1	
5(1)	VXL2250	OPENER LEVER UNIT	1	
6(1)	VXA4661	CASSETTE HOLDER PLATE UNIT	1	
7(1)	VXA4806	SIDE PLATE (R) UNIT	1	
8(1)	VXP1339	MAIN SHAFT UNIT	1	
9(1)	VXL2251	CLEANER ARM UNIT	1	
10(1)	VXP1366	CLEANER ROLLER UNIT	1	
12(1)	VBS0050	FE HEAD	1	
13(1)	VDG0871	CARRIAGE CONNECTION GEAR	1	
14(1)	VDG0886	PINCH CAM GEAR	1	
15(1)	VXP1402	IMPEDANCE ROLLER UNIT	1	
20(1)	VED0205	A/C HEAD (1) UNIT	1	
22(1)	VMA8624	A/C HEAD BASE	1	
23(1)	VMB2515	A/C HEAD SPRING	3	
25(1)	VMA8761	MOUNT ANGLE	1	
26(1)	VMA8763	HEAD AMP MOUNT ANGLE (L)	1	
27(1)	VMC0917	EARTH SPRING	1	
28(1)	VMA8874	INCLIND BASE HOLDER (S)	1	
29(1)	VMD2078	P5 STOPPER BASE	1	
30(1)	VXA4927	P5 POST STOPPER	1	
31(1)	VMA8873	INCLIND BASE HOLDER (T)	1	
32(1)	VMD2101	OPENER PIECE	1	
33(1)	VML2776	TENSION SPRING ARM	1	
34(1)	VMX1544	P4 UPPER LIMITER	1	
35(1)	VMX2175	P4 SLEEVE	1	
36(1)	VMX2176	P4 LOWER LIMITER	1	
40(1)	VXA4982KIT	INCLIND BASE (S) UNIT	1	
41(1)	VXP1415	ROLLER POST (S)	1	
42(1)	VXA4984KIT	INCLIND BASE (T) UNIT	1	
44(1)	VXA4869	HEAD AMP MOUNT ANGLE (R) U.	1	
45(1)	VMS5383	CASSETTE POSITION FIXTURE	1	
46(1)	VXL2310	REVIEW ARM UNIT	1	
47(1)	VXL2306	P5 ARM UNIT	1	
48(1)	VXL2243	TAKE UP TENSION REGULATOR ARM UNIT	1	
49(1)	VXL2246	PINCH ARM UNIT	1	
50(1)	VMB2434	TENSION SPRING	1	
51(1)	VXL2309	TENSION ARM (1) UNIT	1	
52(1)	VXZ0310	TENSION BAND UNIT	1	
60(1)	VXR0221	SUPPLY REEL TABLE UNIT	1	
61(1)	VXR0222	TAKE UP REEL TABLE UNIT	1	
62(1)	VXS0114	EARTH PLATE	1	
63(1)	VXZ0312	SUPPLY BRAKE ARM UNIT	1	
64(1)	VXZ0313	TAKE UP BRAKE ARM UNIT	1	
70(1)	VEG1138	CYLINDER UNIT	1	
71(1)	VEH0656	UPPER CYLINDER UNIT	1	
72(1)	VJR0082	RT TERMINAL	1	
B1	VHD0773	SCREW	2	
B2	XTV26+6F	SCREW	4	
B3	XTV26+4F	SCREW	2	
B4	XTN3+6FFZ	SCREW	1	
B5	VHD0425	SCREW	2	
B6	VHD0762	SCREW	3	
B7	XTV26+6FZ	SCREW	2	
B8	XTV26+8F	SCREW	3	
B9	VHD0760	SCREW	2	
B10	VHD0342	SCREW	3	
N1	VHN0192	NUT	3	
N2	VHN0193	NUT	1	
W1	VMX2208	WASHER	3	
W2	XWGV26D5G	WASHER	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
100(2)	VEK5927	STATOR UNIT	1	
101(2)	VBK0061	FG HEAD	1	
103(2)	VMA8765	ROTOR STOPPER	1	
104(2)	VMX1927	OIL SEAL	2	
105(2)	VXD0140	HOUSING UNIT	1	
106(2)	VXP1471	ROTOR UNIT	1	
107(2)	VXQ0297	THRUST SCREW UNIT	1	
108(2)	VDG0913	MAIN CAM GEAR	1	
109(2)	VDG0861	SUPPLY REEL GEAR	1	
110(2)	VDG0862	TAKE UP REEL GEAR	1	
111(2)	VDG0868	WORM WHEEL GEAR	1	
112(2)	VDG0885	SUB CAM GEAR	1	
113(2)	VDV0235	TIMING BELT	1	
120(2)	VDG0866	WORM GEAR	1	
121(2)	VEM0427	LOADING MOTOR (1) UNIT	1	
123(2)	VMD1942	MOTOR BRACKET	1	
126(2)	VML2725	IDLER CONTROL LEVER	1	
127(2)	VSS0365	MODE SW	1	
128(2)	VMA8965	SS BRAKE BASE UNIT	1	
129(2)	VXA4799	TENSION ROLLER UNIT	1	
140(2)	VXL2229	IDLER ARM UNIT	1	
141(2)	VXL2230	DIRECT LEVER UNIT	1	
142(2)	VXL2299	SUPPLY LOADING ARM UNIT	1	
143(2)	VXL2300	TAKE UP LOADING ARM UNIT	1	
144(2)	VXL2307	MAIN LEVER UNIT	1	
145(2)	VXP1409	CENTRE CLUTCH	1	
150(2)	VMD1926	LED HOLDER	1	
151(2)	VMD1927	PHOTO TRANSISTOR HOLDER	2	
152(2)	VES0695	SAFETY TAB SW	1	
153(2)	VJB00S63	MECHANISM CONNECTION C.B.	1	ELECTRICAL PARTS ON THE C.B.A.IS LISTED ON ELECTRICAL PARTS LIST.
154(2)	VMD2029	REEL SHAFT GUIDE	1	
B101	VHD0772	SCREW	4	
B102	XTV26+8F	SCREW	2	
B103	XTV26+6F	SCREW	3	
B104	VHD0753	SCREW	3	
B105	VHD0754	SCREW	1	
B106	XSB26+4FZ	SCREW	1	
W101	VMX2208	WASHER	3	

❷ CHASSIS PARTS SECTION (2)



❸ CASING PARTS SECTION



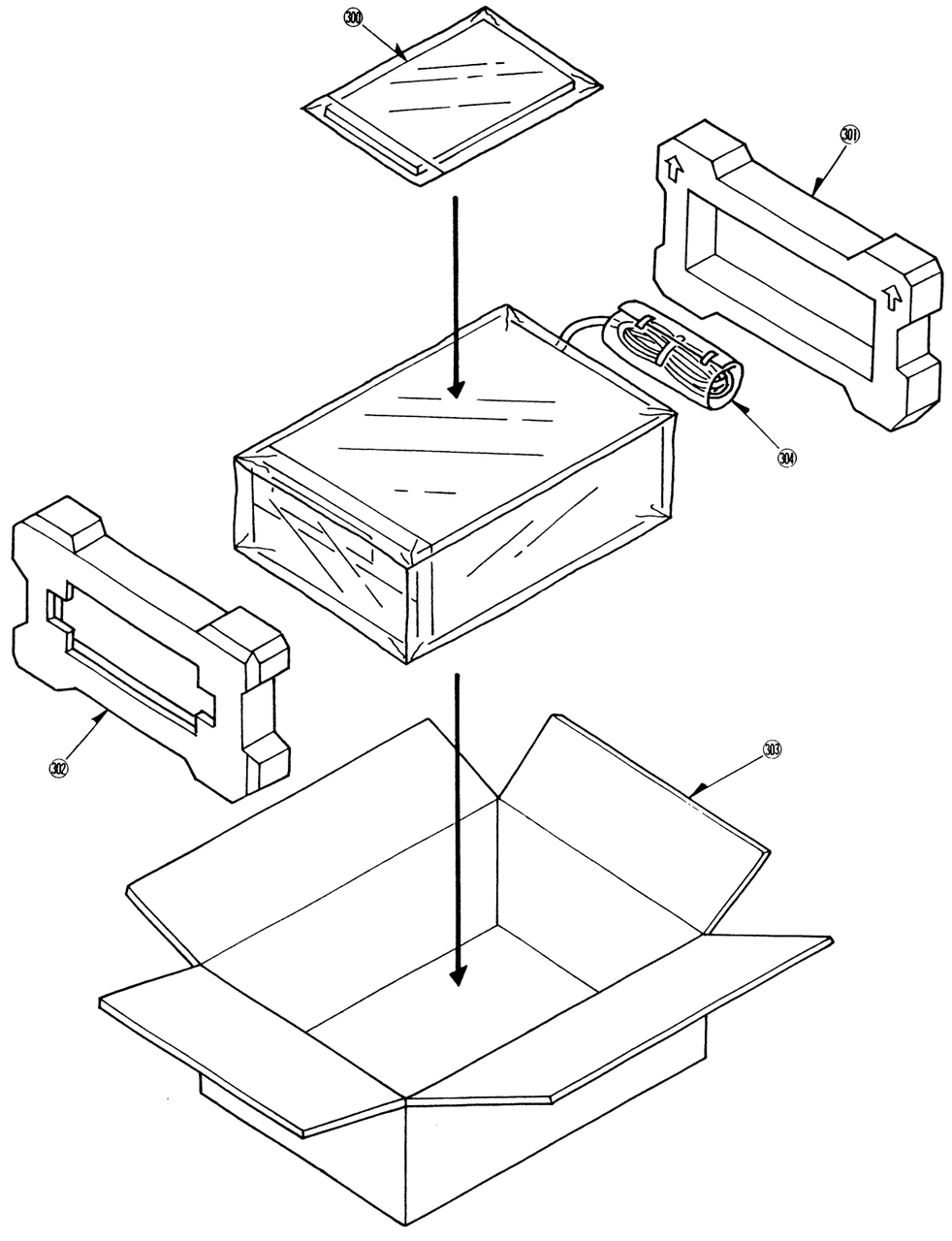
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
200(3)	VGM1045	TOP PANEL	1	
201(3)	VHD0222	SCREW	2	
202(3)	VMX2248	SPACER	2	
203(3)	VSC4044	SHIELD SEAT (B)	1	
204(3)	XBA2C16TH15	FUSE 1.6A/125V	1	<!>
205(3)	VJA0675	AC CORD	1	<!>FOR AG-6124E
205(3)	VJA0800	AC CORD	1	<!>FOR AG-6124B
206(3)	VMX0936	AC CORD BUSHING	1	<!>
207(3)	VMP4260	POWER PLATE	1	
208(3)	VMX0237	AC CORD COVER	1	<!>
209(3)	VJF0649	RIVET	1	
210(3)	VMZ2292	BARRIER	1	
211(3)	VMC0357	TR HOLDER SPRING	1	
212(3)	VMC0525	EARTH SPRING	1	
213(3)	VMZ2243	BARRIER	1	
214(3)	VSC3999	BARRIER	1	
215(3)	VSC3959	SHIELD PLATE	1	
216(3)	VJH12	EARTH TERMINAL	1	
217(3)	VKC0295	SPACER	2	
218(3)	VKC0422	SPACER	2	
219(3)	VKC0421	HINGE	3	
220(3)	VGM1046	SIDE PANEL (R)	1	
221(3)	VHD0305	SCREW	4	
222(3)	VJF1094	P.C.BOARD HOLDER	1	
223(3)	VJF0649	RIVET	1	
224(3)	VMP4218	EARTH ANGLE (B)	2	
225(3)	VSC4046	SHIELD SEAT (C)	2	
226(3)	VMP4217	EARTH ANGLE (A)	2	
227(3)	VKA0133	RUBBER FOOT	4	
228(3)	VGU5582	SLIDE SW SHEET	1	
229(3)	VYP5455	FRONT PANEL UNIT	1	
230(3)	VKF2127	BLINDER PANEL	1	
231(3)	VMB2521	BLINDER PANEL SPRING	1	
232(3)	VKU0390	BOTTOM PLATE	1	
233(3)	VHD0168	SCREW	3	
234(3)	VJH0733	REAR JACK PANEL	1	
235(3)	VJJ0323	RCA PIN JACK	1	
236(3)	VJS3154	BNC CONNECTOR	2	
237(3)	VWJ20AW470B0	FLEXIBLE CABLE	1	
238(3)	VWJ0785	FLEXIBLE CABLE	1	
239(3)	VWJ15AW510B0	FLEXIBLE CABLE	1	
240(3)	VWJ20AW385B0	FLEXIBLE CABLE	1	
241(3)	VWJ13AW200B0	FLEXIBLE CABLE	1	
242(3)	VWJ12AW610B0	FLEXIBLE CABLE	1	
243(3)	VSC3957	SHIELD CASE	1	
244(3)	VSC3958	SHIELD CASE	1	
245(3)	VGM1070	SIDE PANEL (L)	1	
246(3)	VKF2133	FRONT DOOR	1	
247(3)	VGQ1442	LATCH	1	
248(3)	VJH0735	TERMINAL UNIT	1	
249(3)	VJJ0322	RCA PIN JACK	1	
250(3)	VGQ3373	BATTERY COVER	1	
W1	XWC4BFY	WASHER	2	
B1	XTV3+6F	SCREW	4	
B2	XTV26+4F	SCREW	1	
B3	XTB3+10F	SCREW	4	
B4	XTV3+10GR	SCREW	6	
B5	XTV3+6FR	SCREW	1	
B6	XYE3+EF8FR	SCREW	1	
B7	XTV3+14J	SCREW	4	
B8	XTV3+6J	SCREW	2	
B9	XTV3+10GFZ	SCREW	4	
B10	XTV3+8FFZ	SCREW	2	
B11	XYE4+EF6	SCREW	1	
B12	XTV26+8FR	SCREW	3	
B13	XTV26+10F	SCREW	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
300(4)	VQT5545	OPERATING INSTRUCTIONS	1	FOR AG-6124E
300(4)	VQT5568	OPERATING INSTRUCTIONS	1	FOR AG-6124B
301(4)	VPN3798	CUSHION (R)	1	
302(4)	VPN3173	CUSHION (F)	1	
303(4)	VPG7288	PACKING CASE	1	FOR AG-6124E
303(4)	VPG7301	PACKING CASE	1	FOR AG-6124B
304(4)	VPF0136	CORD PROTECTION SEAT	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
200(3)	VGM1045	TOP PANEL	1	
201(3)	VHD0222	SCREW	2	
202(3)	VMX2248	SPACER	2	
203(3)	VSC4044	SHIELD SEAT (B)	1	
204(3)	XBA2C16TH15	FUSE 1.6A/125V	1	<!>
205(3)	VJA0675	AC CORD	1	<!>FOR AG-6124E
205(3)	VJA0800	AC CORD	1	<!>FOR AG-6124B
206(3)	VMX0936	AC CORD BUSHING	1	<!>
207(3)	VMP4260	POWER PLATE	1	
208(3)	VMX0237	AC CORD COVER	1	<!>
209(3)	VJF0649	RIVET	1	
210(3)	VMZ2292	BARRIER	1	
211(3)	VMC0357	TR HOLDER SPRING	1	
212(3)	VMC0525	EARTH SPRING	1	
213(3)	VMZ2243	BARRIER	1	
214(3)	VSC3999	BARRIER	1	
215(3)	VSC3959	SHIELD PLATE	1	
216(3)	VJH12	EARTH TERMINAL	1	
217(3)	VKC0295	SPACER	2	
218(3)	VKC0422	SPACER	2	
219(3)	VKC0421	HINGE	3	
220(3)	VGM1046	SIDE PANEL (R)	1	
221(3)	VHD0305	SCREW	4	
222(3)	VJF1094	P.C.BOARD HOLDER	1	
223(3)	VJF0649	RIVET	1	
224(3)	VMP4218	EARTH ANGLE (B)	2	
225(3)	VSC4046	SHIELD SEAT (C)	2	
226(3)	VMP4217	EARTH ANGLE (A)	2	
227(3)	VKA0133	RUBBER FOOT	4	
228(3)	VGU5582	SLIDE SW SHEET	1	
229(3)	VYP5455	FRONT PANEL UNIT	1	
230(3)	VKF2127	BLINDER PANEL	1	
231(3)	VMB2521	BLINDER PANEL SPRING	1	
232(3)	VKU0390	BOTTOM PLATE	1	
233(3)	VHD0168	SCREW	3	
234(3)	VJH0733	REAR JACK PANEL	1	
235(3)	VJJ0323	RCA PIN JACK	1	
236(3)	VJS3154	BNC CONNECTOR	2	
237(3)	VWJ20AW470B0	FLEXIBLE CABLE	1	
238(3)	VWJ0785	FLEXIBLE CABLE	1	
239(3)	VWJ15AW510B0	FLEXIBLE CABLE	1	
240(3)	VWJ20AW385B0	FLEXIBLE CABLE	1	
241(3)	VWJ13AW200B0	FLEXIBLE CABLE	1	
242(3)	VWJ12AW610B0	FLEXIBLE CABLE	1	
243(3)	VSC3957	SHIELD CASE	1	
244(3)	VSC3958	SHIELD CASE	1	
245(3)	VGM1070	SIDE PANEL (L)	1	
246(3)	VKF2133	FRONT DOOR	1	
247(3)	VGQ1442	LATCH	1	
248(3)	VJH0735	TERMINAL UNIT	1	
249(3)	VJJ0322	RCA PIN JACK	1	
250(3)	VGQ3373	BATTERY COVER	1	
W1	XWC4BFY	WASHER	2	
B1	XTV3+6F	SCREW	4	
B2	XTV26+4F	SCREW	1	
B3	XTB3+10F	SCREW	4	
B4	XTV3+10GR	SCREW	6	
B5	XTV3+6FR	SCREW	1	
B6	XYE3+EF8FR	SCREW	1	
B7	XTV3+14J	SCREW	4	
B8	XTV3+6J	SCREW	2	
B9	XTV3+10GFZ	SCREW	4	
B10	XTV3+8FFZ	SCREW	2	
B11	XYE4+EF6	SCREW	1	
B12	XTV26+8FR	SCREW	3	
B13	XTV26+10F	SCREW	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
300(4)	VQT5545	OPERATING INSTRUCTIONS	1	FOR AG-6124E
300(4)	VQT5568	OPERATING INSTRUCTIONS	1	FOR AG-6124B
301(4)	VPN3798	CUSHION (R)	1	
302(4)	VPN3173	CUSHION (F)	1	
303(4)	VPG7288	PACKING CASE	1	FOR AG-6124E
303(4)	VPG7301	PACKING CASE	1	FOR AG-6124B
304(4)	VPF0136	CORD PROTECTION SEAT	1	

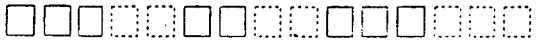
❹ PACKING PARTS SECTION



7-2. ELECTRICAL REPLACEMENT PARTS LIST

1. ● Be sure to make your orders of replacement parts according to this list.
   ● "<R>" in Remark column indicates recommended parts.
   ● "<M>" in Remark column indicates needed in the periodical maintenance.
2. IMPORTANT SAFETY NOTICE
   Components indentified by "<!>" have special characteristics important for safety.
   When replacing any of these components, use only the original ones.
   Meaning of symbol "<!>" on this parts list is exactly the same as symbol⚠on Schematic and Circuit Board Diagrams.
3. Unless otherwise specified;
   All resistors are in (Ω), K=1,000Ω, M=1,000kΩ.
   All capacitors are in (F), U=10^{-6} F, P=10^{-12} F.
4. ITEM NUMBERS WITH CAPITAL LETER E
   Item numbers woth capital leter E (Example: E1, E2, ...) in Ref. no. column mean that the parts are listed with the E item numbers in the exploded views.
5. The main assembled parts are shown below C.B.A. marked with "■".
6. When ordering parts, use parts No. only form Part No. column.
7. Printed circuit board assembly with mark (RTL) is no longer available after discontinuation of the product.
8. Explanation of part number

《 CAPACITOR 》



Type　　Rated Volt.　　Capacitance Value

Type

Type	Delectric
ECA ECE ECS ECO	ELECTROLYTIC CAPACITOR
ECC ECF ECK ECU	CERAMIC CAPACITOR
ECH ECQ ECW	PLASTIC FILM CAPACITOR

Rated Volt.

Code	0G	0J	1A	1C	1D	1E	1V	1H	1J	1K
W.V. (V)	4	6.3	10	16	20	25	35	50	63	80

Code	2A	2C	2P	2D	2E	2F	2V	2G	2W	2H
W.V. (V)	100	160	180	200	250	315	350	400	450	500

Capacitance Value

The 1st 2 figures are actual values and the 3rd denotes the number of zero.
"R" denotes the decimal point and all figures are the actual number with "R".
※ Unit　Electrolytic capacitor ····· μF
　　Ceramic capacitor ····· pF
　　Plastic film capacitor ····· pF

Example : ECEA1HU221 → ELECTCTROYTIC CAPACITOR 50V 220μF

《 RESISTOR 》

Type　　Rated Power　　Resistance Value

Type

Type	Delectric
ERD	CARBON RESISTOR
ERF FRW	WIRE WOUND RESISTOR
ERQ ERU	FISE RESISTOR
ERC	SOLID RESISTOR
ERX ERG ERO ERN	METAL RESISTOR
ERJ	CHIP RESISTOR
ERS	THERMAL SENSTIVE RESISTOR

Rated Power

Code	1	2	3	3G	6	8	10	12	14	25
R.Power (w)	1	2	3	1/16	1/10	1/8	1/8	1/2	1/4	1/4

Code	S1	S2								
R.Power (w)	1/2	1/4								

Resistance Value

The 1st 2 figures are actual values and the 3rd denotes the number of zero.
"R" denotes the decimal point and all figures are the actual number with "R".

Example : ERDS2TJ471 → CARBON RESISTOR 1/4W 470Ω

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEP01588A	P.C.BOARD W/COMPONENT	1	
		POWER (1)		
	VEP01589B	P.C.BOARD W/COMPONENT	1	
		POWER (2)		
	VEP00T75A	P.C.BOARD W/COMPONENT	1	
		BACK UP SUB		
	VEP03A77A	P.C.BOARD W/COMPONENT	1	
		VIDEO SUB		
	VEP04428A	P.C.BOARD W/COMPONENT	1	
		REAR JACK		
	VEP04435A	P.C.BOARD W/COMPONENT	1	
		AUDIO		
	VEP05193A	P.C.BOARD W/COMPONENT	1	
		HEAD AMP		
	VEP06914C	P.C.BOARD W/COMPONENT	1	
		FRONT		
	VEP06916C	P.C.BOARD W/COMPONENT	1	
		FRONT SUB		
	VEP06915C	P.C.BOARD W/COMPONENT	1	
		MAIN		
	VEP00S63C	P.C.BOARD W/COMPONENT	1	
		MECHANISM CONNECTION		

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEP01588A	P.C.BOARD W/COMPONENT		
		POWER (1)		
		CAPACITORS		
C1007	ECQU2A104MN	P.CAPACITOR 100V 1U	1	<!>
C1008	ECQU2A154MN	P.CAPACITOR 100V 0.15U	1	<!>
C1009	ECEC2GC680BB	E.CAPACITOR 400V 68P	1	
C1010	VCC0024	C.CAPACITOR	1	<!>
C1011,12	VCK0046	C.CAPACITOR	2	<!>
C1013	VCK0106K121	C.CAPACITOR 120P	1	
C1014	ECQE6473KF	P.CAPACITOR 0.047U	1	
C1015	ECA1VXLV470	E.CAPACITOR 35V 47U	1	
C1017	ECKD2H101KB	C.CAPACITOR 500V 100P	1	
C1018,19	ECEA1DFZ681	E.CAPACITOR 680U	2	
C1020	ECKD2H101KB	C.CAPACITOR 500V 100P	1	
C1021,22	ECEA1AFZ681	E.CAPACITOR 10V 680U	2	
C1023	ECQV1H124JZ	P.CAPACITOR 50V 0.12U	1	
C1024	ECKF1H101KB	C.CAPACITOR 50V 100P	1	
C1025	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1	
C1026	ECA0GXLV331	E.CAPACITOR 4V 330U	1	
C1027	ECKF1H102KB	C.CAPACITOR 50V 1000P	1	
C1028	ECKF1H271KB	C.CAPACITOR 50V 270P	1	
D1001	S1WBA60S	DIODE	1	
D1002	AP01C	DIODE	1	
D1003	MA178	DIODE	1	
D1004	MA4200-H	DIODE	1	
D1006	RL4Z	DIODE	1	
D1007	31DQ04	DIODE	1	
D1008	MA723	DIODE	1	
IC1001	STRM6545LF	IC	1	<!>
IC1002	SI3120CA	IC	1	<!>
IC1003	TL431CLP	IC	1	
L1006	ELF18D290A	COIL 29UH	1	<!>
L1009	EXCELSA35	COIL	1	
L1011	VLQ0410	COIL	1	
L1012	VLQ0579	COIL	1	
L1013	VLP0083	COIL	1	
L1014	VLP0074	COIL	1	
P1001	VJP3091	CONNECTOR (MALE)	1	
Q1001	PS2561L1V1	TRANSISTOR	1	<!>
		RESISTORS		
R1001	ERDS2FJ103	C.RESISTOR 1/4W 10K	1	
R1002	ERC12GM334	S.RESISTOR 1/2W 330K	1	
R1004	ERF2TK2R2	C.RESISTOR 1/4W 2.2	1	
R1005	ERG3SJ683	M.RESISTOR 3W 68K	1	
R1006,07	ERDS2FJ224	C.RESISTOR 1/4W 220K	2	
R1008	ERDS2FJ221	C.RESISTOR 1/4W 220	1	
R1009	ER0S2CKG62R0	M.RESISTOR 1/4W 62.0	1	
R1010	ER0S2CKG3001	M.RESISTOR 1/4W 3K	1	
R1011	ER0S2CKF2701	C.RESISTOR 1/4W 2700P	1	
R1012	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R1013	ERDS2TJ272	C.RESISTOR 1/4W 2.7K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R1014	ER0S2CKF2701	C.RESISTOR 1/4W 2700P	1	
R1015	ER0S2CKG1502	M.RESISTOR 1/4W 15K	1	
R1016	ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R1017	ERDS2FJ224	C.RESISTOR 1/4W 220K	1	
R1018	ERDS2FJ101	C.RESISTOR 1/4W 100	1	
R1019	ERDS2FJ152	C.RESISTOR 1/4W 1.5K	1	
R1020	ERX1SJR82	M.RESISTOR 1W 0.82	1	
R1021,22	ERDS2FJ471	C.RESISTOR 1/4W 470	2	
R1023	ERDS1TJ395	C.RESISTOR 1/2W 3.9M	1	
R1024	ERDS1TJ475	C.RESISTOR 1/2W 4.7M	1	
T1001	VLT0692	TRANSFORMER	1	<!>
		MISCELLANEOUS		
	VMC0811	IC SUPPORT SPRING	1	
	VMZ1608	CAPACITOR TUBE	1	<!>
	VSC3778	HEAT SINK	1	
	VMZ1305	CAPACITOR COVER	2	<!>
	VMZ0965	CAPACITOR COVER	2	
	VEP01589B	P.C.BOARD W/COMPONENT		
		POWER (2)		
		CAPACITORS		
C1001	VCC0024	C.CAPACITOR	1	<!>
C1002,03	VCK0046	C.CAPACITOR	2	<!>
C1004	VCC0024	C.CAPACITOR	1	<!>
C1005,06	VCK0046	C.CAPACITOR	2	<!>
L1005	ELF18D221F	COIL 220UH	1	<!>
		MISCELLANEOUS		
	VMZ1608	CAPACITOR TUBE	2	<!>
	VJF0318	FUSE HOLDER	2	
	VMZ0965	CAPACITOR COVER	4	
	VEP00T75A	P.C.BOARD W/COMPONENT		
		BACK UP SUB		
BAT6301	VL2330/1HF	BATTERY	1	
P6301	VJP1230T	CONNECTOR (MALE)	1	
		MISCELLANEOUS		
	VGQ3373	BATTERY COVER	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEP03A77A	P.C.BOARD W/COMPONENT		
		VIDEO SUB		
		CAPACITORS		
C3201	ECUM1H121JCN	C.CAPACITOR CH 50V 120P	1	
C3202	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3203	ECUM1H332KBN	C.CAPACITOR CH 50V 3300P	1	
C3204	ECQB1H473JF	P.CAPACITOR 50V 0.047U	1	
C3205,06	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	2	
C3207	ECEA1CKN220	E.CAPACITOR 16V 22U	1	
C3208	ECEA0JKA101	E.CAPACITOR 6.3V 100U	1	
C3209	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3210	ECQP1H392JZ	P.CAPACITOR 50V 3900P	1	
C3211	ECEA1HKGR68	E.CAPACITOR 50V 0.68U	1	
C3212	ECQB1H152JF	P.CAPACITOR 50V 1500P	1	
C3213	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C3214	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
C3215	ECUM1H561JCN	C.CAPACITOR CH 50V 560P	1	
C3216	ECQV1H334JZ	P.CAPACITOR 50V 0.33U	1	
C3217	ECUM1H821JCN	C.CAPACITOR CH 50V 820P	1	
C3218	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3219	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	1	
C3220	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C3221	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3222	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3223	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3224	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	1	
C3226	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3227	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C3228	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3229	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	1	
C3231	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3233	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3235	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3236	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C3237	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	1	
C3238,39	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C3240	ECEA0JU102	E.CAPACITOR 6.3V 1000U	1	
C3241	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3242	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C3244	ECQB1H683JF	P.CAPACITOR 50V 0.068U	1	
C3245	ECEA1EKN4R7	E.CAPACITOR 25V 4.7U	1	
C3246	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3252	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3253	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
CT3201	ECRLB030E12	TRIMMER 3P	1	
D3202	MA28WA	DIODE	1	
D3203-06	MA151K	DIODE	4	
D3207	MA3062M	DIODE	1	
D3208	8P2M	DIODE	1	
IC3201	AN3916	IC	1	
IC3202	AN3296S	IC	1	
IC3203	M35010-001SP	IC	1	
IC3204	MN1280P	IC	1	
IC3205	UPC78L05J	IC	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
L3201-03	VLQ0460	COIL	3	
L3204	VLQ0163J120	COIL 12UH	1	
L3205	VLQ0460	COIL	1	
P3201,02	VJS3186B018	CONNECTOR (FEMALE)	2	
Q3201	MSB709-R	TRANSISTOR	1	
Q3202-06	MSD601-R	TRANSISTOR	5	
Q3207	MSB709-R	TRANSISTOR	1	
		RESISTORS		
R3201,02	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3203	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	
R3204	ERJ6GEYJ683	M.RESISTOR CH1/16W 68K	1	
R3205	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3206	ERJ6GEYJ564	M.RESISTOR CH1/16W 560K	1	
R3207	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3208	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R3209	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R3210	ERJ6GEYJ753	M.RESISTOR CH1/16W 75K	1	
R3211	ERJ6GEYJ684	M.RESISTOR CH1/16W 680K	1	
R3212	ERJ6GEYG113	M.RESISTOR CH1/16W 11K	1	
R3213	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3214	ERJ6GEYG473	M.RESISTOR CH1/16W 47K	1	
R3215	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R3216,17	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R3218	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R3219	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1	
R3220,21	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	2	
R3222	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3223	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3224	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3225-27	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	3	
R3228	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3230	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3231	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R3232	ERJ6GEYJ153	M.RESISTOR CH1/16W 15K	1	
R3233	ERDS2TJ101	C.RESISTOR 1/4W 100	1	
VR3201	EVN49CA00B54	V.RESISTOR 50K	1	
W33	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
W66-78	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	13	
X3201	VSX0574	CRYSTAL OSCILLATOR	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEP04428A	P.C.BOARD W/COMPONENT		
		REAR JACK		
		CAPACITORS		
C6901-05	ECQB1H333JF	P.CAPACITOR 50V 0.033U	5	
D6901	MA165	DIODE	1	
D6903	MA165	DIODE	1	
J6901,02	VJS3154	CONNECTOR (FEMALE)	2	
J6903	VJJ0322	RCA JACK	1	
J6904	VJJ0323	RCA JACK	1	
J6905	VJH0735	TERMINAL	1	
P6901,02	VJP1410	CONNECTOR (MALE)	2	
QR6901	UN1211	TRANSISTOR-RESISTOR	1	
		RESISTORS		
R6901	ERDS2TJ750	C.RESISTOR 1/4W 75	1	
VR6901,02	EVND4AA00B15	V.RESISTOR 100K	2	
		MISCELLANEOUS		
	XTV3+8FFZ	SCREW	2	
	XTV3+10GFZ	SCREW	4	
	XTV4+8F	SCREW	1	
	XWC4BFY	WASHER	1	
	VEP04435A	P.C.BOARD W/COMPONENT		
		AUDIO		
		CAPACITORS		
C4801	ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C4802*	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C4804	ECEA1CU471	E.CAPACITOR 16V 470U	1	
C4805	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C4806	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	1	
C4808	ECQV1H154JZ	P.CAPACITOR 50V 0.15U	1	
C4809	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1	
C4810	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C4811	ECUM1H681JCN	C.CAPACITOR CH 50V 680P	1	
C4812,13	ECEA16M10	E.CAPACITOR 16V 0.1U	2	
C4814	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C4815	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1	
C4816	ECEA16M10	E.CAPACITOR 16V 0.1U	1	
C4818	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C4819,20	ECUM1H472KBN	C.CAPACITOR CH 50V 4700P	2	
C4821	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C4822	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C4823,24	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	2	
C4825	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C4826	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
C4827-30	ECEA1CKA100	E.CAPACITOR 16V 10U	4	
C4831	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C4832,33	ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C4834	ECEA1HKN010	E.CAPACITOR 50V 1U	1	
C4835	ECEA1CKA220	E.CAPACITOR 16V 22U	1	
C4836	ECQB1H102JF	P.CAPACITOR 50V 1000P	1	
C4837	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1	
C4838	ECCD2H121K	C.CAPACITOR 500V 120P	1	
C4839	ECQP1332JZ	P.CAPACITOR	1	
C4840	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C4841	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C4842	ECEA1CKA101	E.CAPACITOR 16V 100U	1	
C4843	ECQB1H123JF	P.CAPACITOR 50V 0.012U	1	
C4845	ECEA1HKAR22	E.CAPACITOR 50V 0.22U	1	
D4801	11EQS04	DIODE	1	
D4802	MA723	DIODE	1	
D4803	MA165	DIODE	1	
IC4801	BA7766AS	IC	1	
IC4802	M52055FP	IC	1	
L4801	VLQEL05K101J	COIL 100UH	1	
L4802	VLQEL07F822J	COIL 8200UH	1	
L4803	VLQEL05K102J	COIL 1000UH	1	
P4801	VJS3186B018	CONNECTOR (FEMALE)	1	
P4803	VJS3186B018	CONNECTOR (FEMALE)	1	
Q4801	2SB710A-R	TRANSISTOR	1	
Q4802,03	2SD1149-R	TRANSISTOR	2	
Q4804	MSD601-R	TRANSISTOR	1	
Q4805	2SB710	TRANSISTOR	1	
Q4806	2SD639-R	TRANSISTOR	1	
Q4807	2SD1328-R	TRANSISTOR	1	
Q4808	MSB709-R	TRANSISTOR	1	
QR4801-03	MRN1404	TRANSISTOR-RESISTOR	3	
QR4804	MRN2404	TRANSISTOR-RESISTOR	1	
QR4805-08	MRN1404	TRANSISTOR-RESISTOR	4	
		RESISTORS		
R4801	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4802	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R4803,04	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R4805	ERJ6GEYG223	M.RESISTOR CH1/16W 22K	1	
R4806	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R4807	ERJ6GEYG181	M.RESISTOR CH1/16W 180	1	
R4811	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R4813,14	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	2	
R4815	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R4816	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R4817	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R4818	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R4819	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R4821	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R4822	ERJ6GEYJ683	M.RESISTOR CH1/16W 68K	1	
R4823	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R4824	ERJ6GEYJ334	M.RESISTOR CH1/16W 330K	1	
R4825	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4826	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R4827	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R4829	ERJ6GEYJ183	M.RESISTOR CH1/16W 18K	1	
R4830	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R4831	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R4832	ERJ6GEYG392	M.RESISTOR CH1/16W 3.9K	1	
R4833	ERJ6GEYG303	M.RESISTOR CH1/16W 30K	1	
R4834	ERJ6GEYG103	M.RESISTOR CH1/16W 10K	1	
R4835	ERJ6GEYG104	M.RESISTOR CH1/16W 100K	1	
R4836	ERJ6GEYG473	M.RESISTOR CH1/16W 47K	1	
R4837	ERJ6GEYG104	M.RESISTOR CH1/16W 100K	1	
R4838	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R4839	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4840	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R4841,42	ERJ6GEYJ563	M.RESISTOR CH1/16W 56K	2	
R4843	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4844	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R4845	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R4846	ERJ6GEYJ153	M.RESISTOR CH1/16W 15K	1	
R4847	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4848	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R4849	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R4850-52	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	3	
R4853	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R4854	ERJ6GEYJ683	M.RESISTOR CH1/16W 68K	1	
R4855	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R4856	ERJ6GEYJ821	M.RESISTOR CH1/16W 820	1	
R4858	ERJ6GEYJ271	M.RESISTOR CH1/16W 270	1	
T4801	EIQ7QF014Q	TRANSFORMER	1	
W31-48	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	18	
	VEP05193A	P.C.BOARD W/COMPONENT		
		HEAD AMP		
		CAPACITORS		
C502	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C503	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	1	
C505-08	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4	
C509	ECUM1H332KBN	C.CAPACITOR CH 50V 3300P	1	
C510,11	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	2	
C512	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C513	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C514	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C515,16	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	2	
C517,18	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C519,20	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	2	
C521	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C523-25	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
C526	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C527	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C540	ECEA1HKA010	E.CAPACITOR 50V 1U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C567	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
IC501	AN3336SB	IC	1	
L501,02	VLQ0460	COIL	2	
P501	VJS3537B014G	CONNECTOR (FEMALE)	1	
P502	VJS3069	CONNECTOR (FEMALE)	1	
QR501	MRN2404	TRANSISTOR-RESISTOR	1	
		RESISTORS		
R501	ERJ6GEYJ101	M.RESISTOR CH1/16W 100	1	
R502	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1	
R503	ERJ6GEYG752	M.RESISTOR CH1/16W 7.5K	1	
R504	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R505	ERJ6GEYJ182	M.RESISTOR CH1/16W 1.8K	1	
R506	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	
R507	ERJ6GEYJ391	M.RESISTOR CH1/16W 390	1	
R508	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R509-12	ERJ6GEYJ470	M.RESISTOR CH1/16W 47	4	
R513	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R516	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R517	ERJ6GEYJ100	M.RESISTOR CH1/16W 10	1	
R526	ERJ6GEYG133	M.RESISTOR CH1/16W 13K	1	
R529-31	ERJ6GEYJ100	M.RESISTOR CH1/16W 10	3	
R568	ERJ6GEYJ271	M.RESISTOR CH1/16W 270	1	
R569	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
W20-24	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	5	
		MISCELLANEOUS		
	VSC3304	SHIELD CASE (MAIN)	1	
	VSC3768	SHIELD CASE (TOP)	1	
	VSC3770	SHIELD CASE (BOTTOM)	1	
	VEP06914C	P.C.BOARD W/COMPONENT		
		FRONT		
		CAPACITORS		
C6502	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C6503	ECEA1HKAR22	E.CAPACITOR 50V 0.22U	1	
C6504	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C6507	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C6508	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1	
C6509	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C6510	ECEA1HKA3R3	E.CAPACITOR 50V 3.3U	1	
C6511	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C6512,13	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C6514	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C6522	ECEA1AKA330	E.CAPACITOR 10V 33U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C6524	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C6526-28	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	3	
C6529	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C6530,31	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	2	
C6534,35	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	2	
C6536	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C6582-84	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	3	
C6851	ECQB1H123JF	P.CAPACITOR 50V 0.012U	1	
CT6501,02	ECRHA030E41	TRIMMER 3P	2	
D6501-08	MA151WA	DIODE	8	
D6510	MA151A	DIODE	1	
D6520-22	MA153	DIODE	3	
D6525	11EQS04	DIODE	1	
D6526	MA151A	DIODE	1	
DP6501	EDD063Y78A4P	DISPLAY TUBE	1	
IC6501	UPD75336C079	IC	1	
IC6503	VCR0172	IC	1	
IC6505	MN1382-H	IC	1	
IC6510	UPD6253GS	IC	1	
IC6511	MN1382-R	IC	1	
JK6850	VJJ0277	M2 JACK	1	
JK6852	VJJ0210	MIC JACK	1	
L6501	VLQEL05K121J	COIL 120UH	1	
LD6501	LN043572P	IC	1	
LD6502-05	LN81RCPHL	LED	4	
P6501	VJS3537A012G	CONNECTOR (FEMALE)	1	
P6502	VJS3537A020G	CONNECTOR (FEMALE)	1	
P6503	VJP3042A008W	CONNECTOR (MALE)	1	
P6850	VJS3042B008W	CONNECTOR (FEMALE)	1	
QR6501-04	MRN2402	TRANSISTOR-RESISTOR	4	
		RESISTORS		
R6509-12	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	4	
R6513-16	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	4	
R6518	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R6519	VRE0034E153	M.RESISTOR CH 1/10W 15K	1	
R6520	VRE0034E392	M.RESISTOR CH 1/10W 3.9K	1	
R6521	VRE0034E683	M.RESISTOR CH 1/10W 68K	1	
R6524	ERJ6GEYJ820	M.RESISTOR CH1/16W 82	1	
R6525	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R6527	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R6528-30	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	3	
R6533	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1	
R6535	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R6537-39	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	3	
R6540	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R6550	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R6551	ERJ6GEYJ224	M.RESISTOR CH1/16W 220K	1	
R6552-57	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	6	
R6558	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R6559	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R6562-64	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	3	
R6565	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R6568-71	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	4	
R6574,75	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
R6579-82	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	4	
R6583	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R6586	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R6587	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R6588	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R6589	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	
R6590	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
SW6501-08	EVQQSB05G	SWITCH	8	
SW6509	EVQPAD09K	SWITCH	1	
SW6510-15	EVQQS307K	SWITCH	6	
SW6516	VSS0249	SWITCH	1	
SW6517	EVQQS307K	SWITCH	1	
SW6519	EVQQS307K	SWITCH	1	
X6501	VSX0140	CRYSTAL OSCILLATOR	1	
X6502	VSX0094	CRYSTAL OSCILLATOR	1	
		MISCELLANEOUS		
	VJF0948	CRT HOLDER	1	
	VMX0473	LED SPACER	4	
	VEP06915C	P.C.BOARD W/COMPONENT		
		MAIN		
		CAPACITORS		
C2001,02	ECEA1CKA220	E.CAPACITOR 16V 22U	2	
C2003	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C2004	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
C2005	ECEA0JKA221	E.CAPACITOR 6.3V 220U	1	
C2006	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C2007	ECEA1HKA3R3	E.CAPACITOR 50V 3.3U	1	
C2008	ECEA1CKA220	E.CAPACITOR 16V 22U	1	
C2009	ECUM1H223KBN	C.CAPACITOR CH 50V 0.022U	1	
C2010,11	ECEA1EKN3R3	E.CAPACITOR 25V 3.3U	2	
C2012	ECUM1H472KBN	C.CAPACITOR CH 50V 4700P	1	
C2013	ECEA1CKA330	E.CAPACITOR 16V 33U	1	
C2014	ECUM1H392KBN	C.CAPACITOR CH 50V 3900P	1	
C2015	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C2016	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C2017	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	1	
C2018	ECEA1CKN100	E.CAPACITOR 16V 10U	1	
C2019	ECEA1AKA330	E.CAPACITOR 10V 33U	1	
C2020	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1	
C2021	ECEA1CKN100	E.CAPACITOR 16V 10U	1	
C2022	ECQB1H223JF	P.CAPACITOR 50V 0.022U	1	
C2023	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C2024	ECEA1CKA220	E.CAPACITOR 16V 22U	1	
C2025	ECQB1H682JF	P.CAPACITOR 50V 6800P	1	
C2026	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C2027	ECUM1H561JCN	C.CAPACITOR CH 50V 560P	1	
C2301	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C2302	ECEA1HKN4R7	E.CAPACITOR 50V 4.7U	1	
C2303-06	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	4	
C2307	ECQB1H683JF	P.CAPACITOR 50V 0.068U	1	
C2308,09	ECEA1HKN4R7	E.CAPACITOR 50V 4.7U	2	
C2310	ECQB1H473JF	P.CAPACITOR 50V 0.047U	1	
C2311	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C2312	ECQV1H474JZ	P.CAPACITOR 50V 0.47U	1	
C2313	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C2314	ECEA0JKA221	E.CAPACITOR 6.3V 220U	1	
C2315	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C2316	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	1	
C2317-19	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	3	
C2320-23	ECUM1H333KBN	C.CAPACITOR CH 50V 0.033U	4	
C2325	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C2326	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
C2329,30	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	2	
C2331	ECEA0JU102	E.CAPACITOR 6.3V 1000U	1	
C2332	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
C2333	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	1	
C2334	ECEA1HKN2R2	E.CAPACITOR 50V 2.2U	1	
C2335	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
C2336	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	1	
C2337,38	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	2	
C2339	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C2340	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C2341	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C2342,43	ECUM1H333KBN	C.CAPACITOR CH 50V 0.033U	2	
C2344-46	ECEA1CU471	E.CAPACITOR 16V 470U	3	
C2347	ECEA1HKN2R2	E.CAPACITOR 50V 2.2U	1	
C2348	ECEA0JKA221	E.CAPACITOR 6.3V 220U	1	
C3002	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	1	
C3003	ECQB1H153JF	P.CAPACITOR 50V 0.015U	1	
C3004,05	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	2	
C3006	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C3007	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C3008	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3009	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
C3010	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C3011	ECUM1H030CCN	C.CAPACITOR CH 50V 3P	1	
C3012	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3013	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C3014	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3015	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3016	ECUM1E224ZFN	C.CAPACITOR CH 25V 0.22U	1	
C3017	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3018	ECEA0JU102	E.CAPACITOR 6.3V 1000U	1	
C3046	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3047	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C3048	ECQB1H562JF	P.CAPACITOR 50V 5600P	1	
C3049	ECEA1CPK470	E.CAPACITOR 16V 47U	1	
C3050	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C3051	ECEA0JKA331	E.CAPACITOR 6.3V 330U	1	
C3052	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C3053	ECEA1HKN4R7	E.CAPACITOR 50V 4.7U	1	
C3054	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	1	
C3055	ECEA1HKN2R2	E.CAPACITOR 50V 2.2U	1	
C3056	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3057	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
C3064	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3066,67	ECEA0JKN470	E.CAPACITOR 6.3V 47U	2	
C3068	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C3069	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3070	ECEA1EKA4R7	E.CAPACITOR 25V 4.7U	1	
C3071	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
C3079	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3084	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3096	ECUM1H120JCN	C.CAPACITOR CH 50V 12P	1	
C3501	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3502	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C3503	ECUM1H181JCN	C.CAPACITOR CH 50V 180P	1	
C3504-07	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4	
C3508	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3509	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C3510	ECEA0JKA101	E.CAPACITOR 6.3V 100U	1	
C3511,12	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C3513	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
C3514	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3516	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1	
C3517	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3518	ECUM1H681JCN	C.CAPACITOR CH 50V 680P	1	
C3519	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3520	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3521	ECEA1CKA100	E.CAPACITOR 16V 10U	1	
C3522,23	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C3524	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3525	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3527	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3528	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	1	
C3529	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3530	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3531	ECEA1EKN4R7	E.CAPACITOR 25V 4.7U	1	
C3532	ECEA1HKA4R7	E.CAPACITOR 50V 4.7U	1	
C3534	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3535	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
C3536	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C3537	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C3541	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
C3542	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C3543	ECEA1CKA220	E.CAPACITOR 16V 22U	1	
C3544	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3546	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
C3547	ECUM1H102JCN	C.CAPACITOR CH 50V 1000P	1	
C3548	ECUM1H050DCN	C.CAPACITOR CH 50V 5P	1	
C3549	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3550	ECEA1AKA221	E.CAPACITOR 10V 220U	1	
C3551	ECUM1H181JCN	C.CAPACITOR CH 50V 180P	1	
C3552	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C3553	ECQB1H562JF	P.CAPACITOR 50V 5600P	1	
C3554	ECEA1HFS4R7	E.CAPACITOR 50V 4.7U	1	
C3555,56	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	2	
C3557	ECEA1EKA4R7	E.CAPACITOR 25V 4.7U	1	
C3558	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3559	ECQV1H474JZ	P.CAPACITOR 50V 0.47U	1	
C3560	ECUM1H821JCN	C.CAPACITOR CH 50V 820P	1	
C3561	ECQB1H393JF	P.CAPACITOR 50V 0.039U	1	
C3563	ECEA1AKA101	E.CAPACITOR 10V 100U	1	
C3565	ECUM1H391JCN	C.CAPACITOR CH 50V 390P	1	
C3566	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C3567	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3568,69	ECQV1H184JZ	P.CAPACITOR 50V 0.18U	2	
C3570	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
C3571	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3572	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
C3573,74	ECEA1CKA100	E.CAPACITOR 16V 10U	2	
C3581	ECUM1H470JCN	C.CAPACITOR CH 50V 47P	1	
C3582	ECUM1H060DCN	C.CAPACITOR CH 50V 6P	1	
C3583	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3584	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C3588-90	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3	
C3593	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3594	ECUM1H181JCN	C.CAPACITOR CH 50V 180P	1	
C3596	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C4001	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
C6001	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C6004,05	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	2	
C6006	ECEA1AKA101	E.CAPACITOR 10V 100U	1	
C6007	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C6008	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C6009	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C6010	ECEA1AKA220	E.CAPACITOR 10V 22U	1	
C6011	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C6012	ECQB1H332JF	P.CAPACITOR 50V 3300P	1	
C6013,14	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	2	
C6016-23	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	8	
C6025-28	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	4	
C6029,30	ECUM1H222KBN	C.CAPACITOR CH 50V 2200P	2	
C6033	ECEA0JKA101	E.CAPACITOR 6.3V 100U	1	
C6034	ECEA1CKA220	E.CAPACITOR 16V 22U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C6103,04	ECEA0JKA221	E.CAPACITOR 6.3V 220U	2	
C6105	ECEA1CKA470	E.CAPACITOR 16V 47U	1	
D2001,02	MA151WK	DIODE	2	
D2301,02	11EQS04	DIODE	2	
D2303	MA151K	DIODE	1	
D2304,05	MA153	DIODE	2	
D2306	MA4062M	DIODE	1	
D3501	MA4091	DIODE	1	
D3502	MA151K	DIODE	1	
D3504	MA151K	DIODE	1	
D3508	MA151WA	DIODE	1	
D6001-06	MA151K	DIODE	6	
D6008	11EQS04	DIODE	1	
D6009	MA3120-M	DIODE	1	
D6010	MA151K	DIODE	1	
D6101	11EQS04	DIODE	1	
D6102	MA704	DIODE	1	
D6103	MA723	DIODE	1	
DL3003	VLD0125	DELAY	1	
DL3501	VLD0147	DELAY	1	
DL3503	VLD0153	DELAY	1	
FL3002	VLF0499	FILTER	1	
FL3003	VLF0878	FILTER	1	
FL3004	ELB4M022	FILTER	1	
FL3501	VLF0727	FILTER	1	
FL3502	VLF0299	FILTER	1	
IC2001	AN3727S	IC	1	
IC2002	MC14070BF	IC	1	
IC2003	TC7W00F	IC	1	
IC2004	LM358PS	IC	1	
IC2005	TC4S66F	IC	1	
IC2006	LM393PS	IC	1	
IC2301	AN3815K	IC	1	
IC2302	BA6439S	IC	1	
IC2303	MN1280-U	IC	1	
IC2304	LM393PS	IC	1	
IC2305,06	UPC4556G2	IC	2	
IC3001	VEFH03D	IC	1	
IC3005	NJM2233BMA	IC	1	
IC3501	MN74HC4053S	IC	1	
IC3502	MSM6965-3RS	IC	1	
IC3503	VEFH04F	IC	1	
IC6001	MN67434VMEB	IC	1	
IC6002	LM358PS	IC	1	
IC6003	BA6219B	IC	1	
IC6004	MN1280	IC	1	
IC6005	TC4W53F	IC	1	
IC6006	TC7W00F	IC	1	
J3002	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3004-07	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	4	
J3009	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3012,13	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
J3023	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3501	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3503	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3505	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J3507	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
J4001,02	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
J6008,09	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
JG1	VEU2B220BB		1	
L2001-04	VLQ0460	COIL	4	
L2301	VLQ0460	COIL	1	
L2304	VLQ0460	COIL	1	
L2305	VLQEL05K102J	COIL 1000UH	1	
L3001	VLQEL05K680J	COIL 68UH	1	
L3002	VLQEL05K270J	COIL 27UH	1	
L3003	VLQ0460	COIL	1	
L3004	VLQEL05K820J	COIL 82UH	1	
L3005	VLQ0460	COIL	1	
L3012	VLQEL05K220J	COIL 22UH	1	
L3013	VLQ0460	COIL	1	
L3014	VLQEL05K2R2J	COIL 2.2UH	1	
L3018	VLQEL05K121J	COIL 120UH	1	
L3502	VLQEL05K820J	COIL 82UH	1	
L3503	VLQEL05K151J	COIL 150UH	1	
L3504-06	VLQ0460	COIL	3	
L3508	VLQEL05K151J	COIL 150UH	1	
L3509	VLQEL05K270J	COIL 27UH	1	
L3510	VLQEL05K470J	COIL 47UH	1	
L3511	VLQ0460	COIL	1	
L3514	VLQEL05K681J	COIL 680UH	1	
L3515,16	VLQ0460	COIL	2	
L3517	VLQEL05K6R8J	COIL 6.8UH	1	
L3518	VLQEL05K101J	COIL 100UH	1	
L3519	VLQEL05K120J	COIL 12UH	1	
L3520	VLQEL05K150J	COIL 15UH	1	
L3523	VLQEL05K681J	COIL 680UH	1	
L3524	VLQEL05K391J	COIL 390UH	1	
L3526	VLQEL05K560J	COIL 56UH	1	
L3531	VLQEL05K270J	COIL 27UH	1	
L3532	VLQEL05K5R6J	COIL 5.6UH	1	
L6002	VLP0083	COIL	1	
L6003	VLQ0460	COIL	1	
L6004-07	VLQEL05K221J	COIL 220UH	4	
LJ5	VEUDA055BBZ		1	
LJ6	VEUDA250BBZ		1	
LJ7	VEUDA290BBZ		1	
P2301	VJP3078	CONNECTOR (MALE)	1	
P2302	VJS3537A015G	CONNECTOR (FEMALE)	1	
P2303	VJP3529	CONNECTOR (MALE)	1	
P3501	VJS3537A014G	CONNECTOR (FEMALE)	1	
P4001	VJP3186A018W	CONNECTOR (MALE)	1	
P4003	VJP3186A018W	CONNECTOR (MALE)	1	
P4004	VJS2329	CONNECTOR (FEMALE)	1	
P6001	VJS3537A013G	CONNECTOR (FEMALE)	1	
P6002	VJP1229T	CONNECTOR (MALE)	1	
P6003	VJP3079	CONNECTOR (MALE)	1	
P6004	VJS3537A012G	CONNECTOR (FEMALE)	1	
P6005	VJS3537A020G	CONNECTOR (FEMALE)	1	
P6007,08	VJS1410	CONNECTOR (FEMALE)	2	
P6101,02	VJP3186A018W	CONNECTOR (MALE)	2	
Q3001	MSB709-R	TRANSISTOR	1	
Q3010	MSB709-R	TRANSISTOR	1	
Q3012	MSD601-R	TRANSISTOR	1	
Q3013	2SA1022-B	TRANSISTOR	1	
Q3014	MSC2295-B	TRANSISTOR	1	
Q3501,02	MSD601-R	TRANSISTOR	2	
Q3503,04	MSC2295-B	TRANSISTOR	2	
Q3505,06	MSB709-R	TRANSISTOR	2	
Q3507	MSD601-R	TRANSISTOR	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q3508	2SB642	TRANSISTOR	1	
Q3509	2SB643	TRANSISTOR	1	
Q3510	MSC2295-B	TRANSISTOR	1	
Q3511	MSD601-R	TRANSISTOR	1	
Q3512	MSC2295-B	TRANSISTOR	1	
Q3514,15	MSD601-R	TRANSISTOR	2	
Q3516	MSC2295-B	TRANSISTOR	1	
Q3517,18	MSB709-R	TRANSISTOR	2	
Q6001	MSB709-R	TRANSISTOR	1	
Q6003	MSD601-R	TRANSISTOR	1	
Q6004	2SD601A	TRANSISTOR	1	
Q6101	2SB644-S	TRANSISTOR	1	
QR2001	XN1213	TRANSISTOR-RESISTOR	1	
QR2301	MRN2404	TRANSISTOR-RESISTOR	1	
QR2302	MRN1404	TRANSISTOR-RESISTOR	1	
QR3002	XN1213	TRANSISTOR-RESISTOR	1	
QR3008	MRN2404	TRANSISTOR-RESISTOR	1	
QR3011,12	MRN1403	TRANSISTOR-RESISTOR	2	
QR3015	MRN1404	TRANSISTOR-RESISTOR	1	
QR3501	MRN1404	TRANSISTOR-RESISTOR	1	
QR3505	MRN1402	TRANSISTOR-RESISTOR	1	
QR3506	MRN2402	TRANSISTOR-RESISTOR	1	
QR3507	DTC363EK	TRANSISTOR-RESISTOR	1	
QR3508	MRN1403	TRANSISTOR-RESISTOR	1	
QR3509,10	XN1213	TRANSISTOR-RESISTOR	2	
QR3514	DTC363EK	TRANSISTOR-RESISTOR	1	
QR3515	MRN1403	TRANSISTOR-RESISTOR	1	
QR6001	XN1211	TRANSISTOR-RESISTOR	1	
QR6003	MRN1402	TRANSISTOR-RESISTOR	1	
QR6004	MRN1404	TRANSISTOR-RESISTOR	1	
QR6005	XN1213	TRANSISTOR-RESISTOR	1	
QR6007	XN1213	TRANSISTOR-RESISTOR	1	
QR6008	MRN1404	TRANSISTOR-RESISTOR	1	
QR6101	MRN1402	TRANSISTOR-RESISTOR	1	
		RESISTORS		
R2001	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R2002	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R2003	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	1	
R2004	ERJ6GEYJ563	M.RESISTOR CH1/16W 56K	1	
R2005,06	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2	
R2007	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R2008	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	1	
R2009	ERJ6GEYG622	M.RESISTOR CH1/16W 6.2K	1	
R2011,12	ERJ6GEYJ224	M.RESISTOR CH1/16W 220K	2	
R2013,14	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2	
R2015	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R2016	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1	
R2017	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R2018-20	ERJ6GEYG223	M.RESISTOR CH1/16W 22K	3	
R2021	ERJ6GEYG333	M.RESISTOR CH1/16W 33K	1	
R2022	ERJ6GEYG224	M.RESISTOR CH1/16W 220K	1	
R2023	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R2024,25	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2	
R2029	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R2301	ERDS2TJ150	C.RESISTOR 1/4W 15	1	
R2302	ERX12SJR68	M.RESISTOR 1/2W 0.68	1	
R2303,04	ERDS2TJ150	C.RESISTOR 1/4W 15	2	
R2305	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R2306	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R2307,08	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	2	
R2309	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	1	
R2310	ERJ6GEYG432	M.RESISTOR CH1/16W 4.3K	1	
R2311	ERJ6GEYJ684	M.RESISTOR CH1/16W 680K	1	
R2312	ERJ6GEYG473	M.RESISTOR CH1/16W 47K	1	
R2313	ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R2314	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R2315	ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R2316	ERX12SJR47	M.RESISTOR 1/2W 0.47	1	
R2317	ERDS2TJ330	C.RESISTOR 1/4W 33	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R2318	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1	
R2321	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R2322	ERJ6GEYJ224	M.RESISTOR CH1/16W 220K	1	
R2323	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R2324	ERJ6GEYJ224	M.RESISTOR CH1/16W 220K	1	
R2325-28	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	4	
R2329,30	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	2	
R2331	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R2332	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R2333	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R2334	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R2335	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R2336	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R2337	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R2338	ERJ6GEYJ105	M.RESISTOR CH1/16W 1M	1	
R2339	ERJ6GEYJ821	M.RESISTOR CH1/16W 820	1	
R2340	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R2341	ERDS1TJ561	C.RESISTOR 1/2W 560	1	
R2342,43	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3004	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3005	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3006	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3007	ERJ6GEYF124	M.RESISTOR CH1/16W 120K	1	
R3008	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3009	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R3010	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3011	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	
R3012	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3013	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3014	ERJ6GEYJ123	M.RESISTOR CH1/16W 12K	1	
R3015	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3017,18	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	2	
R3019	ERJ6GEYJ750	M.RESISTOR CH1/16W 75	1	
R3020,21	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
R3036	ERJ6GEYG471	M.RESISTOR CH1/16W 470	1	
R3041	ERJ6GEYG102	M.RESISTOR CH1/16W 1K	1	
R3052	ERJ6GEYJ391	M.RESISTOR CH1/16W 390	1	
R3053	ERJ6GEYJ101	M.RESISTOR CH1/16W 100	1	
R3054	ERJ6GEYJ824	M.RESISTOR CH1/16W 820K	1	
R3055,56	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3057	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1	
R3058	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3066,67	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	2	
R3068,69	ERJ6GEYG911	M.RESISTOR CH1/16W 910	2	
R3070	ERJ6GEYG112	M.RESISTOR CH1/16W 1.1K	1	
R3071	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	1	
R3072	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	1	
R3073	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3074	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3075	ERJ6GEYJ821	M.RESISTOR CH1/16W 820	1	
R3076	ERJ6GEYG681	M.RESISTOR CH1/16W 680	1	
R3077	ERJ6GEYJ392	M.RESISTOR CH1/16W 3.9K	1	
R3079	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3085	ERJ6GEYG112	M.RESISTOR CH1/16W 1.1K	1	
R3088	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R3089	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3090	ERJ6GEYG432	M.RESISTOR CH1/16W 4.3K	1	
R3094	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3112	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3118,19	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
R3501,02	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3503	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R3504	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3505,06	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	2	
R3507	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3508,09	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	2	
R3510	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3511	ERJ6GEYJ330	M.RESISTOR CH1/16W 33	1	
R3512	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3513	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3514	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R3515-18	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	4	
R3519	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R3520	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3521	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R3522	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3523	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3524	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R3525	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3526	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3527	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1	
R3528	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R3529	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3530	ERJ6GEYJ821	M.RESISTOR CH1/16W 820	1	
R3533	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3534	ERJ6GEYJ330	M.RESISTOR CH1/16W 33	1	
R3535,36	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2	
R3537	ERJ6GEYJ820	M.RESISTOR CH1/16W 82	1	
R3538	ERJ6GEYG680	M.RESISTOR CH1/16W 68	1	
R3539	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3540	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3542	ERJ6GEYJ822	M.RESISTOR CH1/16W 8.2K	1	
R3543	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R3544,45	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R3547	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R3548	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3549	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3550	ERJ6GEYJ330	M.RESISTOR CH1/16W 33	1	
R3551	ERJ6GEYJ182	M.RESISTOR CH1/16W 1.8K	1	
R3552	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R3553	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3554	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	1	
R3555	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3556	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R3557	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R3560	ERJ6GEYJ821	M.RESISTOR CH1/16W 820	1	
R3561	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	1	
R3562	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3564	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3565	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3566	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3567	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R3568,69	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R3572	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3574	ERJ6GEYJ271	M.RESISTOR CH1/16W 270	1	
R3575	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3576	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3577	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3578	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R3579	ERJ6GEYJ682	M.RESISTOR CH1/16W 6.8K	1	
R3580	ERJ6GEYJ123	M.RESISTOR CH1/16W 12K	1	
R3581	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3582	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R3585	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3588	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3590	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3591	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R3592	ERJ6GEYG621	M.RESISTOR CH1/16W 620	1	
R3593	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R3596	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R3600,01	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3605	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3606	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3613	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R4001	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R4003	ERJ6GEYJ100	M.RESISTOR CH1/16W 10	1	
R4004	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	1	
R6001	ERO S2CKG2000	M.RESISTOR 1/4W 200	1	
R6002	ERJ6GEYJ271	M.RESISTOR CH1/16W 270	1	
R6003,04	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	2	
R6005	ERJ6GEYG244	M.RESISTOR CH1/16W 240K	1	
R6006	ERJ6GEYJ153	M.RESISTOR CH1/16W 15K	1	
R6007	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R6008	ERX1SJ1R8	M.RESISTOR 1W 1.8	1	
R6009	ERJ6GEYG112	M.RESISTOR CH1/16W 1.1K	1	
R6010	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R6011	VRE0034E103	M.RESISTOR CH 1/10W 10K	1	
R6012	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	1	
R6013	VRE0034E103	M.RESISTOR CH 1/10W 10K	1	
R6014	ERJ6GEYJ564	M.RESISTOR CH1/16W 560K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R6015	VRE0034E512	M.RESISTOR CH 1/10W 5.1K	1	
R6016	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R6017	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R6018	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R6019	ERJ6GEYJ683	M.RESISTOR CH1/16W 68K	1	
R6020,21	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2	
R6022	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R6023	ERJ6GEYJ683	M.RESISTOR CH1/16W 68K	1	
R6024-26	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	3	
R6027	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R6028-34	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	7	
R6035	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R6036-38	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	3	
R6039	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R6040	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	1	
R6041	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R6042	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	1	
R6045	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R6047	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R6048	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R6049	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R6052,53	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R6056,57	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	2	
R6058	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R6059	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R6060	ERJ6GEYJ273	M.RESISTOR CH1/16W 27K	1	
R6061	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R6062,63	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	2	
R6065	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R6067	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R6068	VRE0034E472	M.RESISTOR CH 1/10W 4.7K	1	
R6070	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R6101	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
R6102	ERO S2CKG1400	C.RESISTOR 1/4W 140P	1	
R6103	ERJ6GEYG271	M.RESISTOR CH1/16W 270	1	
R6104	ERDS2TJ121	C.RESISTOR 1/4W 120	1	
R6105	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R6114	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
VR2001	EVMF6SA00B23	V.RESISTOR 2K	1	
VR2002-08	EVMF6SA00B15	V.RESISTOR 100K	7	
VR3501	EVMF6SA00B23	V.RESISTOR 2K	1	
VR3502	EVMF6SA00B14	V.RESISTOR 10K	1	
VR3503	EVMF6SA00B52	V.RESISTOR 500	1	
VR3504,05	EVMF6SA00B53	V.RESISTOR 5K	2	
VR3506	EVMF6SA00B52	V.RESISTOR 500	1	
VR4001	EVMF6SA00B54	V.RESISTOR 50K	1	
VR4006	EVMF6SA00B54	V.RESISTOR 50K	1	
W1-W9	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	9	
W10-21	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	12	
X3501	VSX0225	CRYSTAL OSCILLATOR	1	
X3502	VSX0162	CRYSTAL OSCILLATOR	1	
X6001	VSX0296	CRYSTAL OSCILLATOR	1	
		MISCELLANEOUS		
	VKC0295	P.C.B. SPACER	2	
	VKC0421	HINGE	3	
	VKC0422	SPACER	2	
	VMC0075	HEAT SINK SPRING	1	
	VSC3405	HEAT SINK	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEP00S63C	P.C.BOARD W/COMPONENT	1	
		MECHANISM CONNECTION		
IC1501,02	ON1387	IC	2	
P1503	VJS3316A002	CONNECTOR	1	
P1504	VJS3317A004	CONNECTOR	1	
P1505	VJS3493	CONNECTOR	1	
SW1501	VES0695	SWITCH	1	

! Warning
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advice non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service manual by anyone else could result in serious injury or death.

Order No. VSD9504S238
D2

Service Manual

Supplement

NTSC / PAL **Video Product**

Subject :Addition of Barrier Angle

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-1070DCP	4	VSD9409M253	D5-----
AG-6124P	3	VSD9409M253	D5-----
AG-5210P	7	VSD9401M241	D5-----
AG-6124E/B	6	VSD9406M635	D5-----
AG-1070DCE	4	VSD9411M638	D5-----
AG-5260E/B	6	VSD9404M633	D5-----

Symptom : Tape eject and tape insertion may not be performed smoothly.

Cause : The ribbon cables from connectors P6001, P2302 and P6005 on the main C.B.A. may interfere with the cassette front cover.

Remedy : In order to prevent this symptom, the following barrier angle has been added on the right/ rear comer of the front loading unit.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
251	----------	VMP4662	BARRIER ANGLE	1	E	
B14		XTB26+8G	SCREW	2	E	

TM2-3113

Panasonic

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Order No. VSD9608S602

Service Manual

Supplement

Video Product

Subject : Improvement of E-E Y Level Precision

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-6124E	9	VSD9406M635	I6-----
AG-1070DCE	7	VSD9411M638	I6-----

Board: MAIN

Symptom : The E-E Y output level may be out of specification.

Remedy : In order to improve this symptom, the following resistors and variable resistor in the parts list have been changed.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
R3085	ERJ6GEYG102	VRE0034E821	M.RESISTOR CH 1/10W 820	1	C	
R3036	ERJ6GEYG471	VRE0034E471	M.RESISTOR CH 1/10W 470	1	C	
R3076	ERJ6GEYG681	VRE0034E681	M.RESISTOR CH 1/10W 680	1	C	
R3071	ERJ6GEYJ122	ERJ6GEYG122	M.RESISTOR CH 1/10W 1.2K	1	C	
R3013	ERJ6GEYJ222	ERJ6GEYG222	M.RESISTOR CH 1/10W 2.2K	1	C	
R3073	ERJ6GEYJ561	VRE0034E561	M.RESISTOR CH 1/10W 560	1	C	
R3019	ERJ6GEYJ750	ERJ6GEYG750	M.RESISTOR CH 1/10W 75	1	C	

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Order No. VSD9608S603 D

Service Manual

Supplement

Video Product

Subject : Change of Capacitor

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-7150-E/B	50	VSD9109M615	A5----
AG-7350-E/B	53	VSD9109M615	A5----
AG-7355-E/B	38	VSD9110M616	A5----
AG-6040E	30	VSD9209M625	A5----
AG-6730E	34	VSD9212M628	A5----
AG-6045E	5	VSD9501M640	A5----
AG-5700-E	18	VSD9202M619	A5----
AG-MD830E	15	VSD9408M637	A5----
AG-6840HE/B	32	VSD9004M602	A5----
AG-6850H-E/B	32	VSD9006M603	A5----
AG-6124E/B	9	VSD9406M635	A5----
AG-5260E/B	9	VSD9404M633	A5----
AG-7600E	8	VSD9502M642	A5----
AG-7700E	12	VSD9502M642	A5----
AG-8600E	6	VSD9512M601	A5----
AG-8700E	6	VSD9512M601	A5----

Board: POWER

Reason for Change

- ❑ The following part(s) has(have) been changed for serviceability improvement.
- ❑ The following part(s) has(have) been changed for productivity improvement.
- ❑ The following part(s) has(have) been changed for standardization.
- ■ The following part(s) has (have) been changed for the safety regulation.
- ❑

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nterchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
C1008	VCK0041	VCK0259K331A	CAPACITOR	1	C	AG-7150/7350/7355-E/B
C1045	VCK0041	VCK0259K331A	CAPACITOR	1	C	AG-7150/7350/7355-E/B
C1003-5	VCK0040	VCK0259K221A	CAPACITOR	3	C	AG-7150/7350/7355-E/B
C1005	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6045E
C1010	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6045E
C10038	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1001-3	VCC0046	VCK0260K222A	CAPACITOR	3	C	AG-6040/6730/6450E
C1006	VCC0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1036	VCC0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1037	VCC0024	VCK0262K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1002-3	VCK0083	VCK0260M332A	CAPACITOR	2	C	AG-MD830E/B
C1004-5	VCK0043	VCK0259M102A	CAPACITOR	2	C	AG-MD830E/B
C1102-5	VCK0083	VCK0260M332A	CAPACITOR	4	C	AG-5700-E
C1003-4	VCK0046	VCK0260K222A	CAPACITOR	2	C	AG-6840H/6850HE
C1005	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6840H/6850HE
C1027-28	VCK0045	VCK0260K152A	CAPACITOR	2	C	AG-6840H/6850HE
C1029	VCK0045	VCK0260K152A	CAPACITOR	1	C	AG-6840H/6850HE
C1010	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-5260E/B
C1011	VCC0046	VCK0260M222A	CAPACITOR	1	C	AG-5210E/B
C1012	VCC0046	VCK0260M222A	CAPACITOR	1	C	AG-5210E/B
C1010	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1011-12	VCK0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C1001	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1002-3	VCC0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C004	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1005-6	VCC0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C1001-2	VCK0083	VCK0260M332A	CAPACITOR	2	C	AG-7600/7700/8600/8700E
C1004-5	VCK0044	VCK0260M102A	CAPACITOR	2	C	AG-7600/7700/8600/8700E

V11494V
V11494

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Order No. VSD9611S603
D2

Service Manual

Supplement

PAL **Video Product**

Subject : Change of Cylinder Unit and Upper Cylinder

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-6124E	8	VSD9406M635	D6-----
AG-1070DCE	6	VSD9411M638	D6-----

BOARD: MAIN

Reason for Change

- ❑ The following part(s) has(have) been changed for serviceability improvement.
- ❑ The following part(s) has(have) been changed for productivity improvement.
- ■ The following part(s) has(have) been changed for standardization.
- ❑ The following part(s) has (have) been changed for the safety regulation.
- ❑

1. More details information such as schematic diagram P.C. Board layout and parts list of the new board will be issued soon as supplement service manual.
2. "U" indication has been added on the model number plate on the rear panel with the unit has new type cylinder.
3. The new cylinder unit, upper cylinder and main P.C.Board can not feted on a unit which has the original cylinder unit, upper cylinder and main P.C.Board

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
70	VEG1138	VEG1221	CYLINDER UNIT	1	D	FOR AG-6124E/1070DCE
71	VEH0656	VEH0715	UPPER CYLINDER	1	D	FOR AG-6124E/1070DCE
	VEP06915C	VEP06B33B	MAIN C.B.A.	1	D	FOR AG-6124E
	VEP06915H	VEP06B33C	MAIN C.B.A.	1	D	FOR 1070DCE

TE2-4469, TE2-4471

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Upper Cylinder Removal

1. Remove the earth plate with the cable from the cylinder stator P.C.Board. (Figure M1-1)

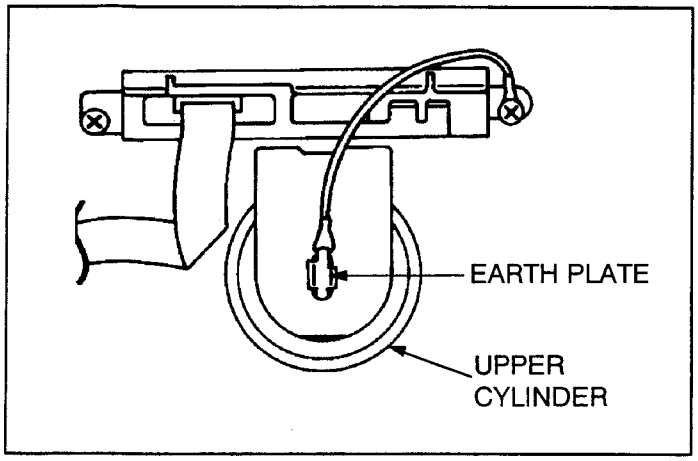

Fig. M1-1

2. Unscrew 2 screws (A) so that the cylinder stator unit can be removed from the cylinder unit. (Figure M1-2)

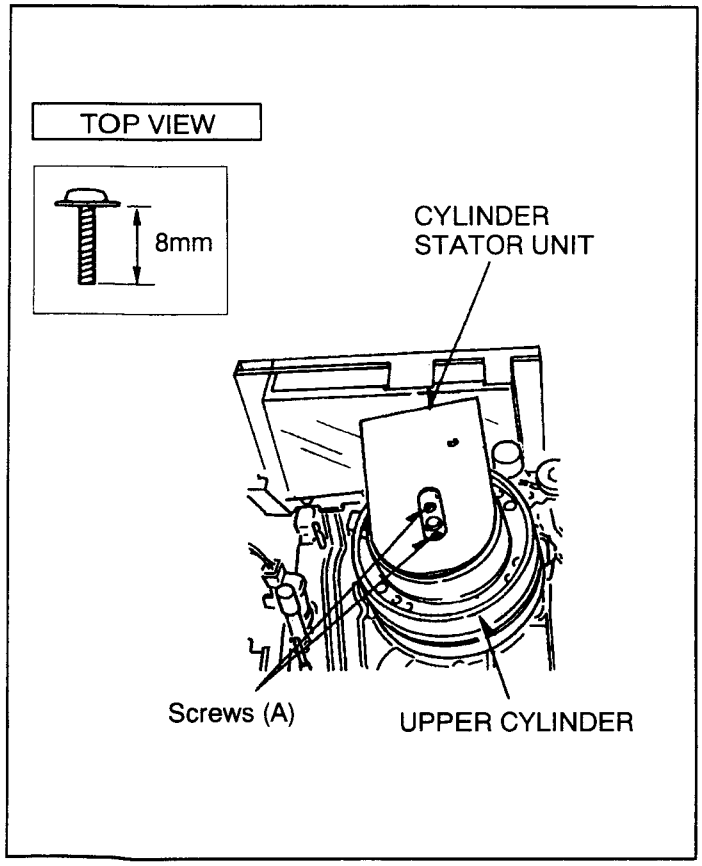

Fig.M1-2

3. Unscrew 2 screws (B) so that the cylinder rotor unit can be removed. (Figure M1-3)
4. Loosen the hex screw (C) in the cylinder retainer by using a 1.5mm hex wrench so that the cylinder retainer and upper cylinder unit can be lifted and removed. (Figure 1-4)

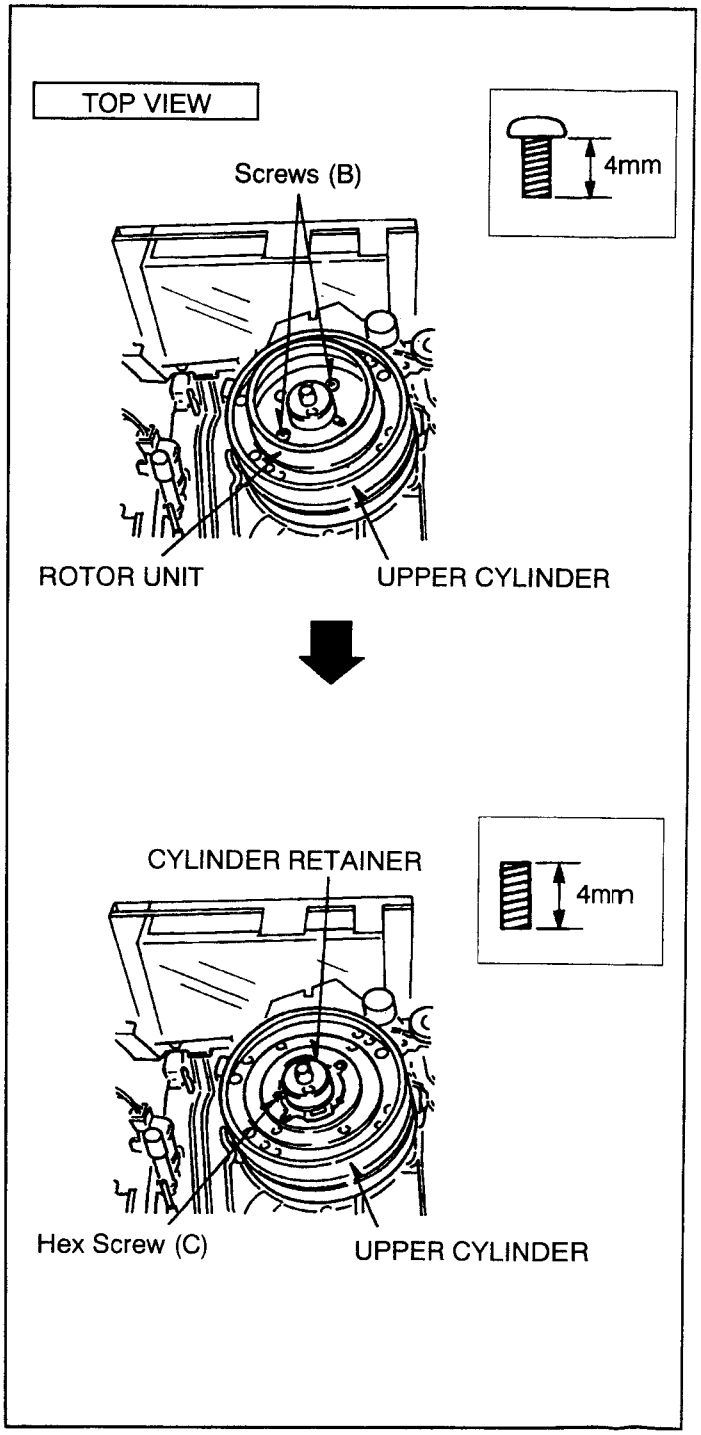

Fig. M1-3

UPPER CYLINDER INSTALLATION

1. Install the upper cylinder unit and retainer.
2. Adjust the position of the retainer so that the 2 screw holes on the retainer becomes as shown Figure M2-1.
3. Tighten 2 screws (C) while strongly pressing down the retainer. (Figure M2-2)
   (If the pressing force is not enough, the tape interchangeability may be out of specification and the life of upper cylinder becomes shorten.)

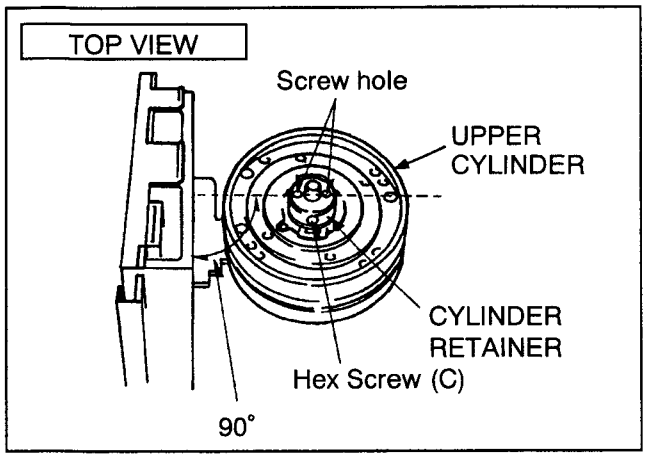

Fig. M2-1

4. Place the cylinder rotor unit so that the inner U cut of cylinder rotor unit and the projection on the upper cylinder are fit each other. (Figure M2-2)
5. Screw 2 screws (B). (Figure M2-3)

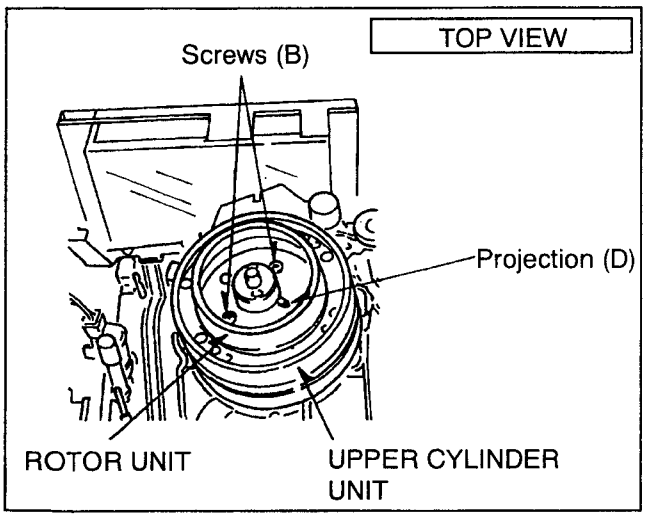

Fig.M2-2

6. Install the cylinder stator unit and tighten 2 screws (A).

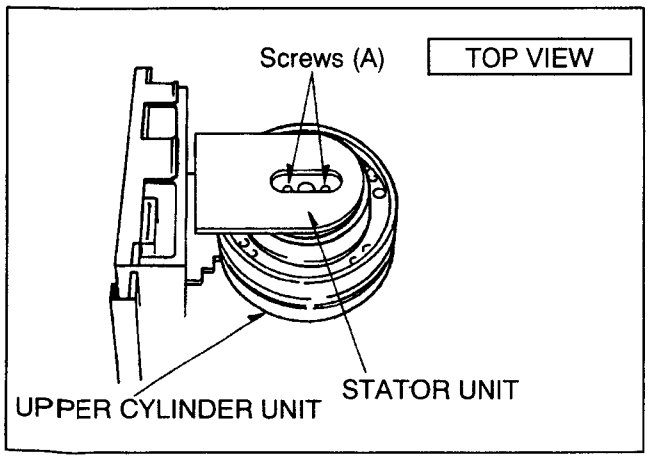

Fig. M2-3

7. After completion of the upper cylinder unit, perform "Tape Interchangeability Adjustment" , " PG Shifter Adjustment" and "Play Frequency Response Adjustment.

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Order No. VSD9811S606

Service Manual

Supplement

PAL **Video Product**

Subject : Alarm input failure

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.		Order No.		Effective from
AG-1070DCE	13	U1434	VSD8810M608	1038063	K8—
AG-6124E	16	U1454	VSD9406M635	-4-	K8—
AG-6124B	16	-1-	VSD9406M635	-1-	K8—

Board: FRONT P.C.Board.(VEP06914C)
REAR JACK P.C.Board (VEP04428A)

Symptom : 1. When the alarm input causes chattering while in the manual alarm mode, alarm REC fails even if alarm is input.
2. Instantaneous power supply interrupt occurs depending on LED lighting timing. Recording starts after recovery of power supply.
3. If two or more alarm resets are input during course of returning from alarm REC to the previous mode, the next alarm will be reset.

Cause : Symptom 1 or 3: Caused by software failure.

Remedy : 1. Added a capacitor on FRONT P.C.Board.
C6225 is added ECEA1CK100 on the foil side.
2. Added a capacitor on REAR JACK P.C.Board.
C6906 is added ECEA0JKA221 on the foil side.
C6907 is added ECEA1CKA100 on the foil side.

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	Remarks
C6525	——	ECEA1CKA100	E. CAPACITOR 16V 10U	1	FRONT P.C.Board.(VEP06914C)
C6906	——	ECEA0JKA221	E. CAPACITOR 6.3V 220U	1	REAR JACK P.C.Board (VEP04428A)
C6907	——	ECEA1CKA100	E. CAPACITOR 16V 10U	1	REAR JACK P.C.Board (VEP04428A)

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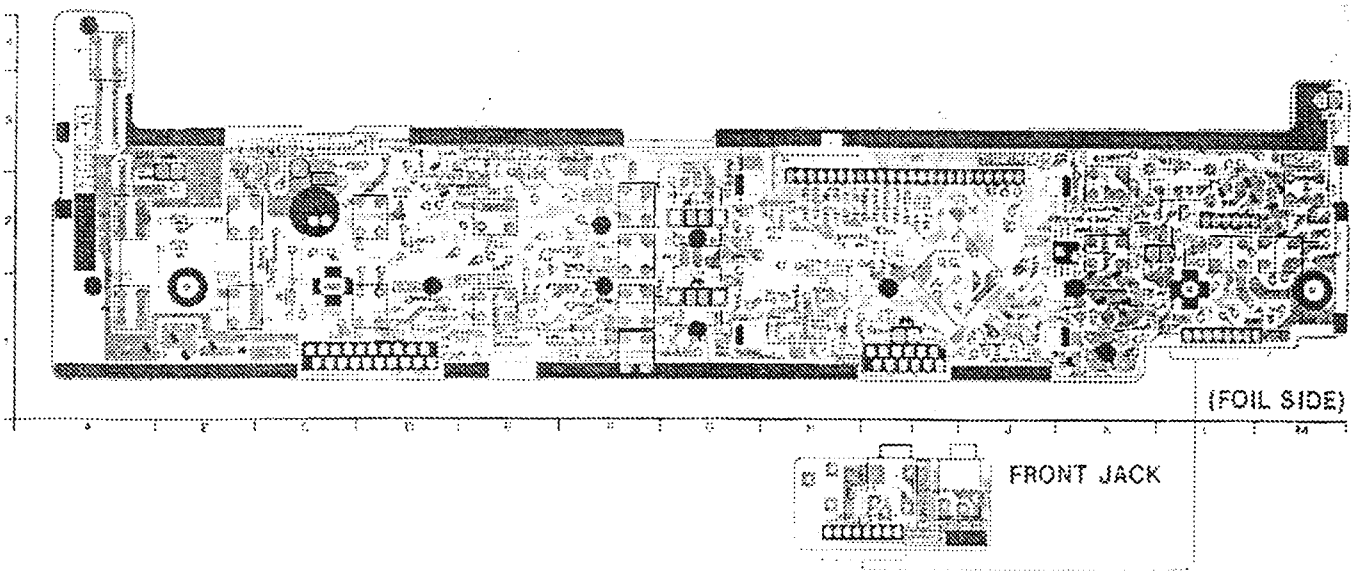
1) FRONT P.C. Board is changed

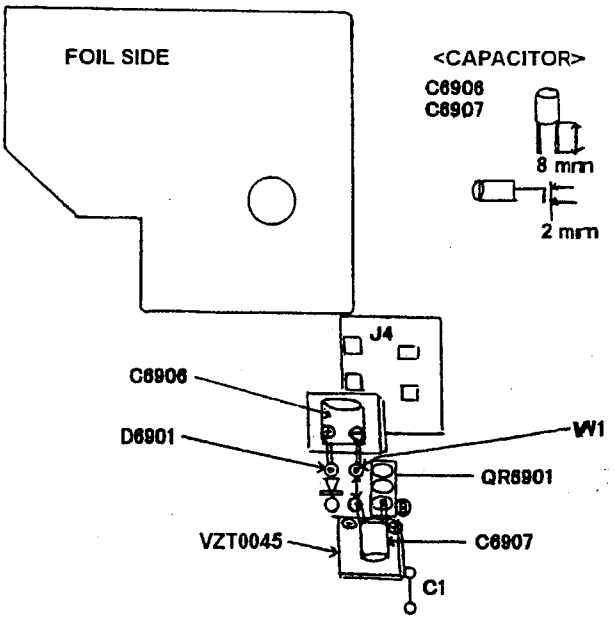
Add a capacitor (ECEACK100) to C6525 (not fixed)



2) READ JACK P.C. Board is changed

1) The C6906 (+) side is soldered to the D6901 (A) SIDE. The C6906 (-) side is soldered to the W1.
2) The C6907 (+) side is soldered to the QR6901 (B) SIDE. The C6907 (-) side is soldered to the W1.
3) After the C6906 and C6907 is soldered, they are fixed by the VZT0045.

* Prepare the capacitor for foil side as shown below.
In case of VEP04428



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Order No. VSD9811S608

Service Manual

Supplement

PAL

Video Product

Subject : Changing Barrier Angle

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.		Order No.		Effective from
AG-1070DCE	14	U11434	VSD9411M638	1038063	K8——
AG-5260E	17		VSD9404M683	—	K8——
AG-6124E	17	U11494	VSD9406M635	1038063	K8——
AG-5260B	17	U01461	VSD9404M633	1014124	K8——
AG-6124B	17	U11494	VSD9406M635	1038063	K8——

Symptom : Very rarely, the flexible cable on the main P.C.Board hits a snag while the cassette is being inserted or ejected.

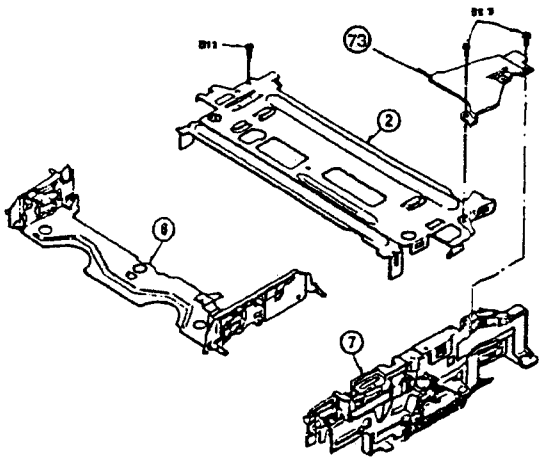
Cause : The Barrier Angle is not large enough to cover whole flexible cable.

Remedy : Change the Barrier Angle.

Part Number					
Ref. No.	Original Part No.	New Part No.	Part Name & Description	Pcs	Remarks
73	VMP4662	VMP6008	Barrier Angle	1	

Change the Barrier Angle with newly designed one (see the figure right).

73 : Barrier Angle (VMP6008)
2 : TOP PLATE (VMA8644)
6 : CASSETTE HOLDER PLATE UNIT (VXA4661)
7 : SIDE PLATE (R) UNIT (VXA4806)



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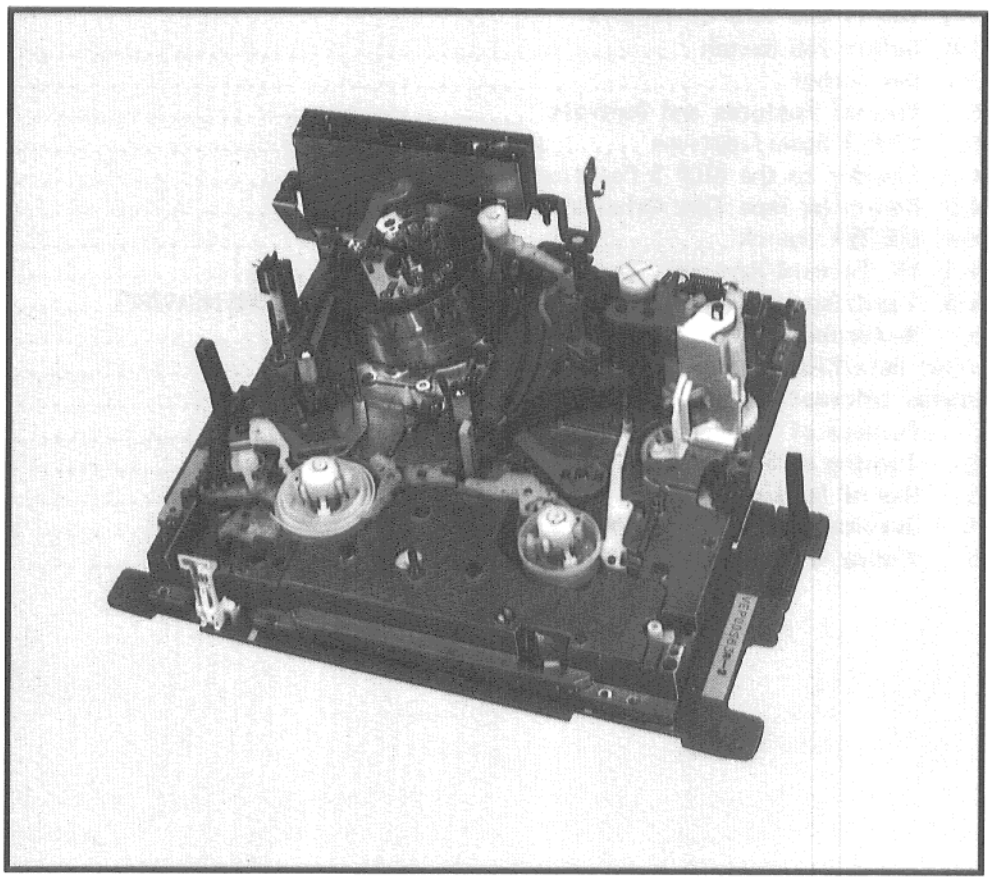
ORDER NO. VRD9302D101

Training Manual

VHS Video Cassette Recorder

K-MECHANISM CHASSIS



INTRODUCTION

The K-Mechanism chassis are built in several Panasonic VHS Video Cassette Recorders from NV-SD series in 1992.

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1. Outline of the K Mechanism

This mechanism maintains the high performance of the G2 mechanism but with a great decrease the quantity of mounted parts, 40% less than the G2.

(1) Parts Reduction

<K Mechanism>

a) Reduction in the number of drive mechanisms through the use of a single motor to perform front loading and unit loading.

b) Direct drive of the brakes and loading gears with the multi-function main lever.

c) Elimination of sub-levers and solenoids.

<Front Loading Unit>

a) Tape end/beginning detector LED is utilized, instead of a slide switch, to reduce the wiring.

b) Elimination or combining joint parts.

c) Smaller and thinner top plate and rack.

Mechanical Types	Number of G Mech. parts	Number of G2 Mech. parts	Number of K Mech. parts	Ratio with G Mech.	Ratio with G2 Mech.
Total Number	398	445	266	−33. 1%	−40. 2%

(2) No adjustment of the following is required:

* take-up reel incline position
* P5 post height

(3) Reduced Gear Phase Position Alignments

The K mechanism has only 6 gear phase alignment positions and the G mechanism has 12 gear phase alignment positions.

1-1. Operation of the K Mechanism

The K mechanism has two motors, the loading motor and the capstan motor. The loading motor operates the front loading/unloading and posts loading/unloading. The capstan motor operates each mode. The bottom C.B.A. connects the mechanism to the system control circuit. On the C.B.A. there are take-up and Supply photosensors, Sensor LED, Mode Switch Connector, Safety Tab Switch, Supply and Take-up Reel Sensors and Loading Motor Connector.

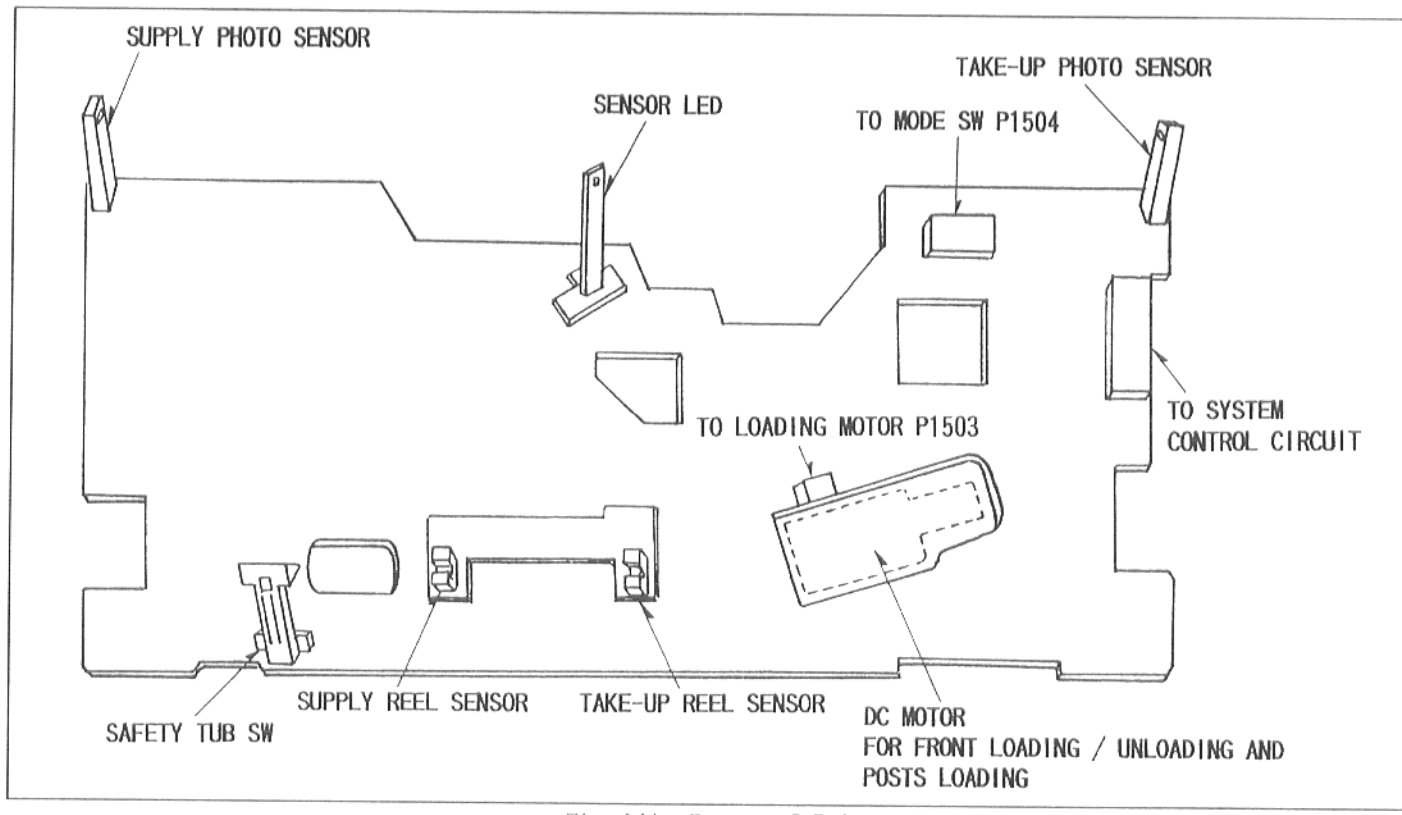


Fig. M1 Bottom C.B.A.

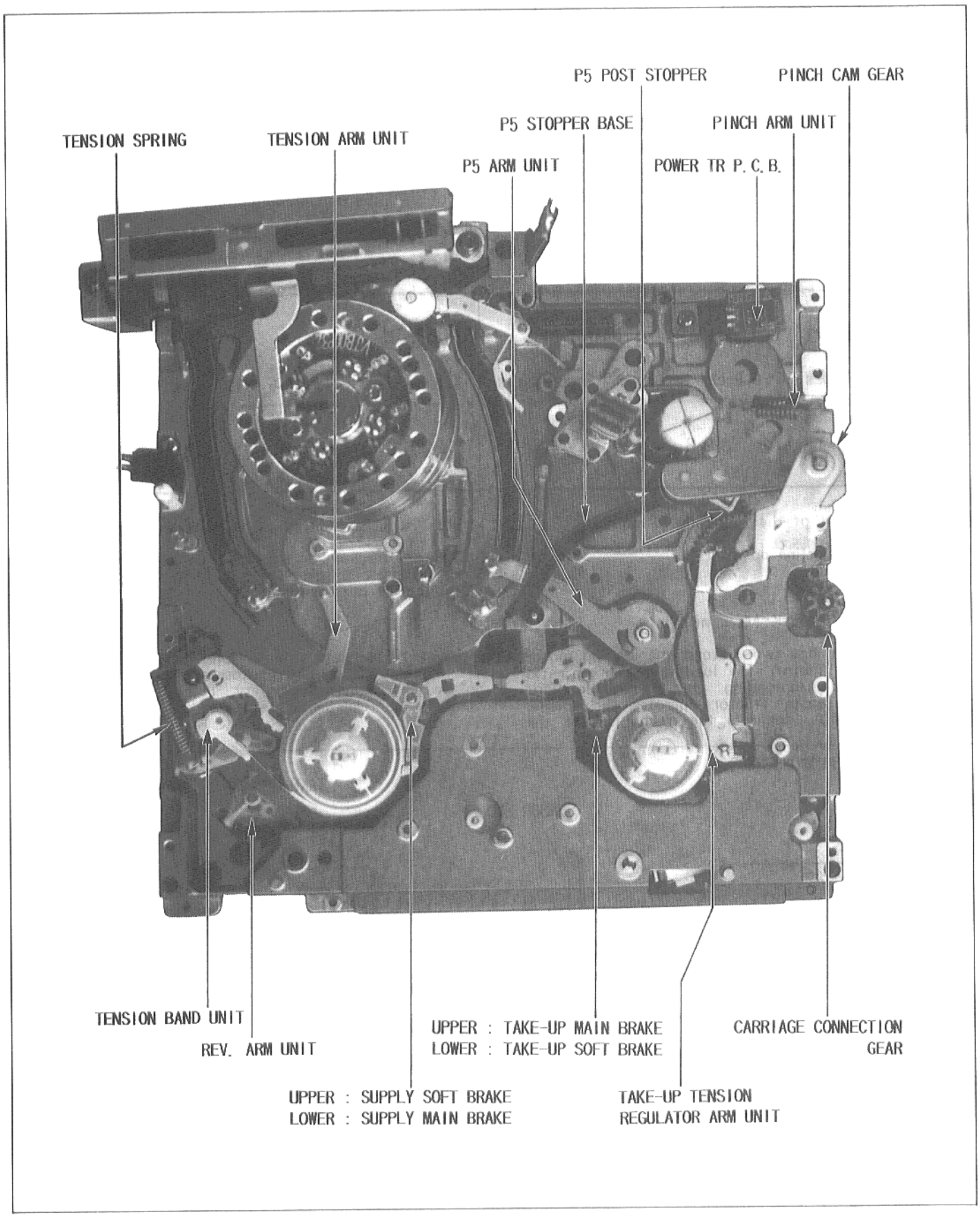


Fig. M2 Top View of K Mechanism

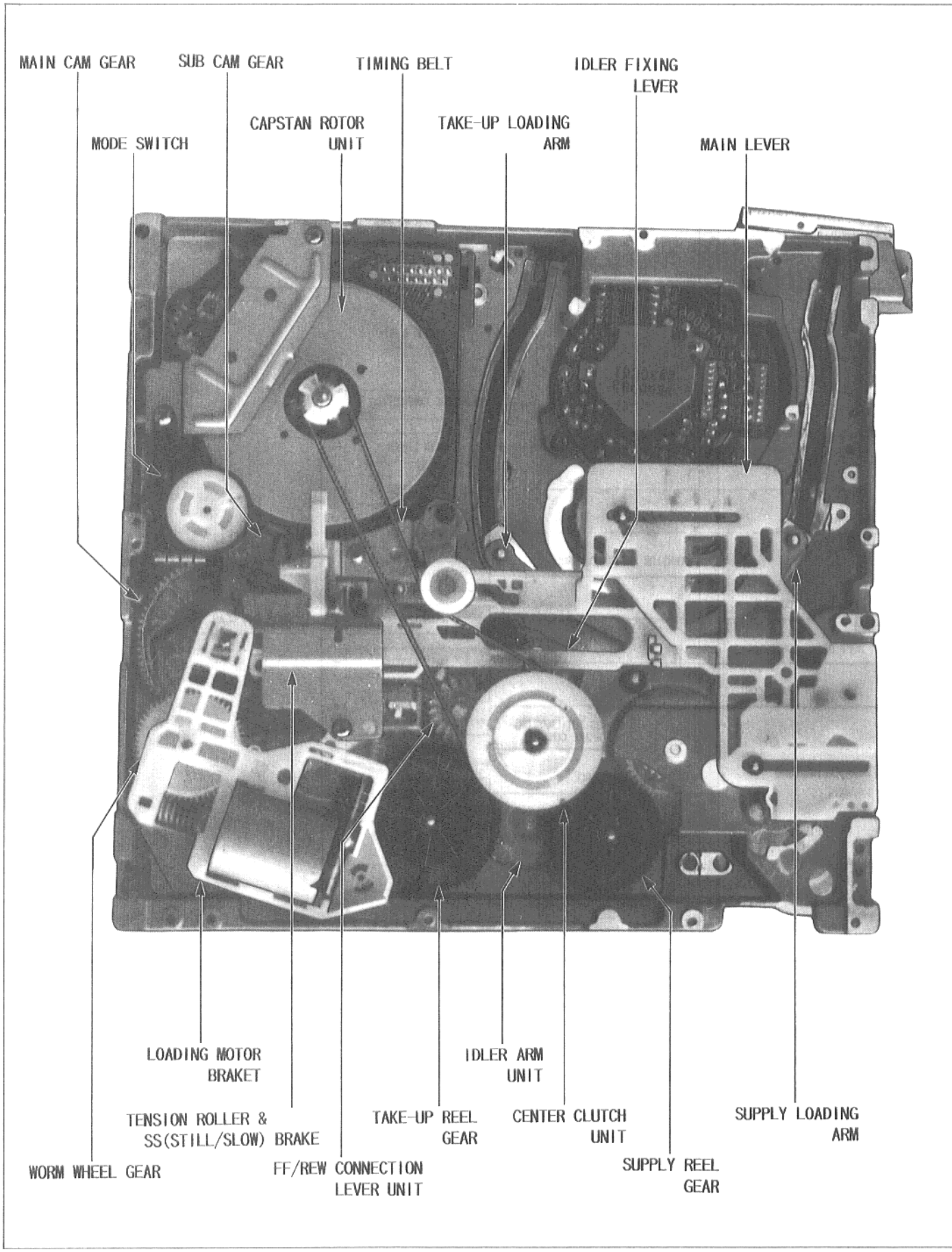


Fig. M3 Bottom View of K Mechanism

1-1-2. Loading Motor Mechanism Movement

(1) Mechanism Control for each mode.

<Example>

When a cassette is inserted into the cassette carriage, the loading motor performs the Cassette Down, Tension Arm, Soft Brake, Main Brake controls. At this time, the drive power of each control is applied as follows,

(1) Cassette Down operation <- Carriage Connection Gear <- Main Cam Gear
(2) Tension Arm operation <- Main Lever <- Main Cam Gear
(3) Soft Brake applied <- Main Lever <- Main Cam Gear
(4) Main Brake applied <- Main Lever <- Main Cam Gear

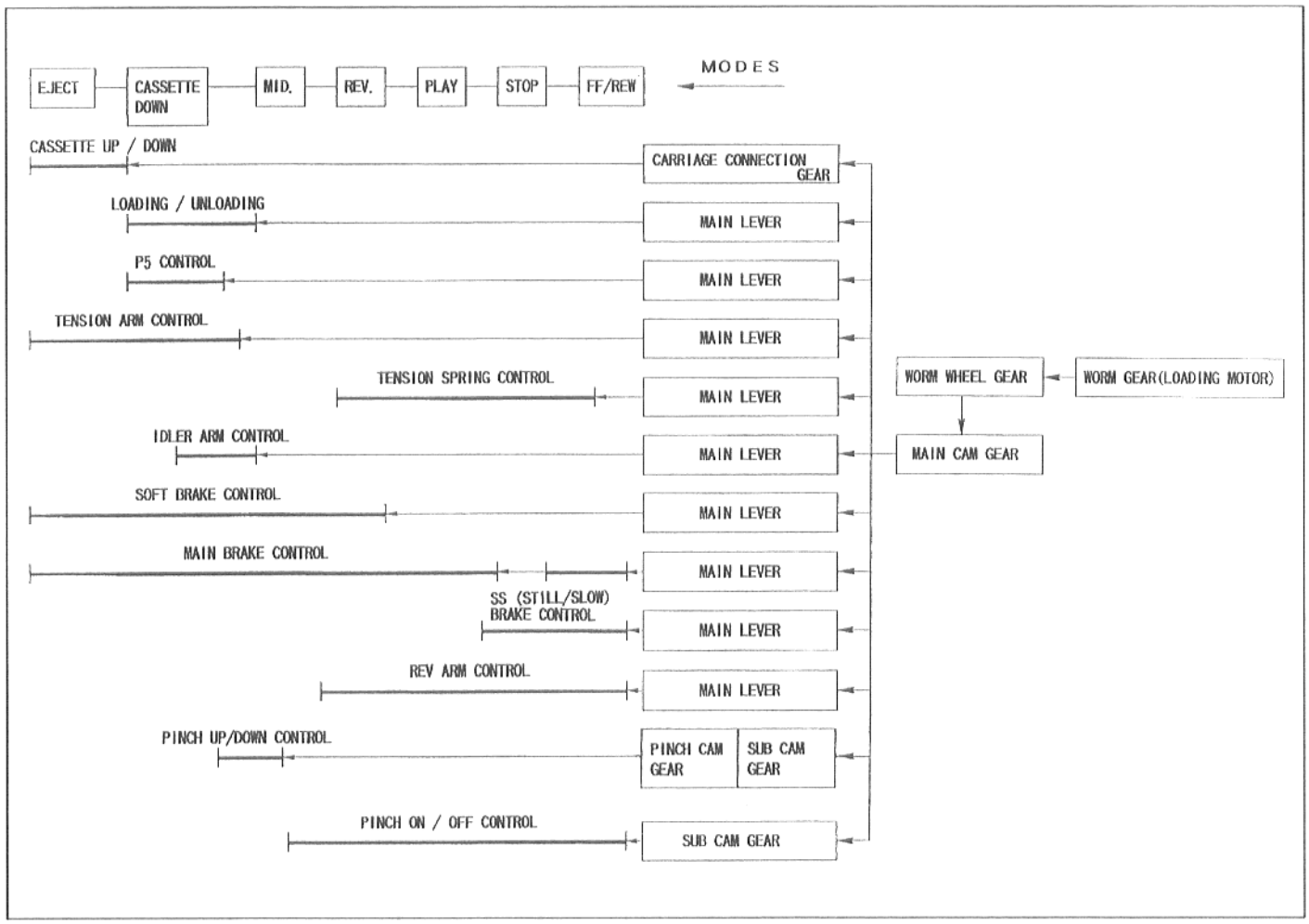


Fig. M4 Transmission Rout of Gears in each Mode

<Detail Mode Operation>

a) MID Loading/Unloading operation
b) REV 1) REV 2) REV SLOW
c) PLAY 1) PLAY 2) CUE 3) STILL
4) FWD SLOW 5) STOP 3
6) REC 7) PAUSE

NOTE:
STOP3 is the position where the Pinch Roller is on the capstan motor shaft.

d) STOP The Pinch Roller is off the capstan motor shaft.

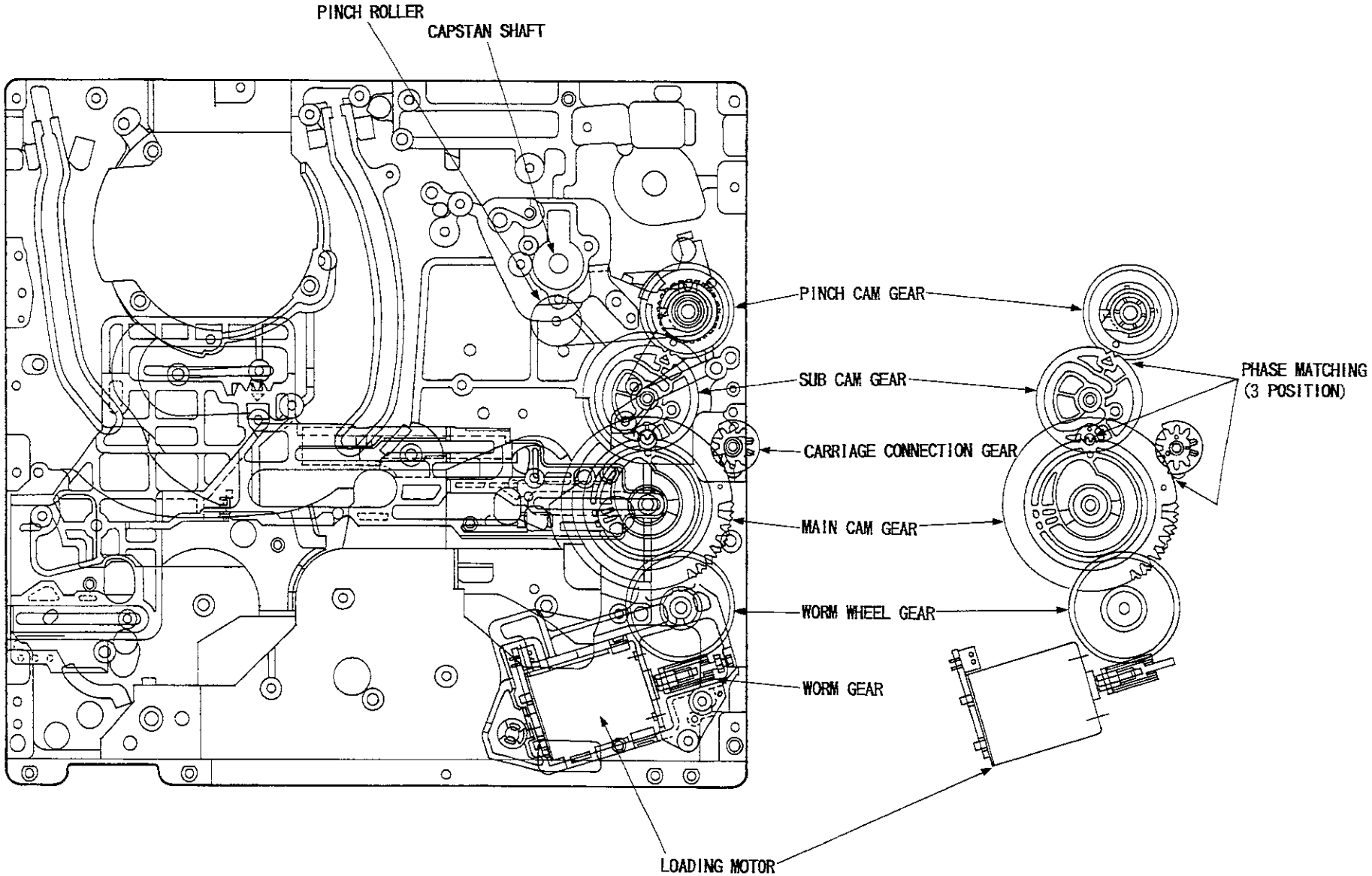


Fig. M5 Top View of Components Location

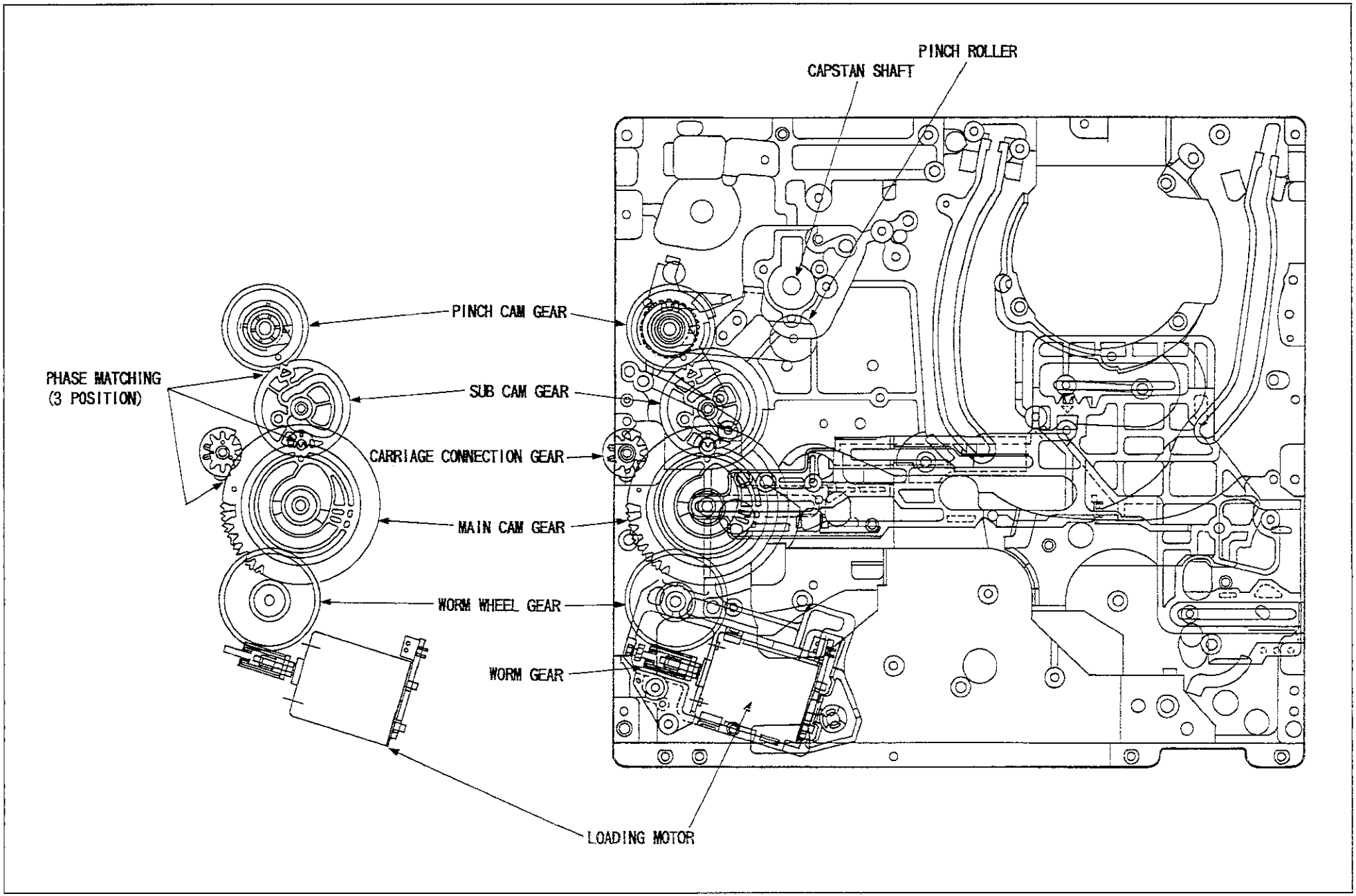


Fig. M6 Bottom View of Components Location

(2) Posts and Main Lever Positions.

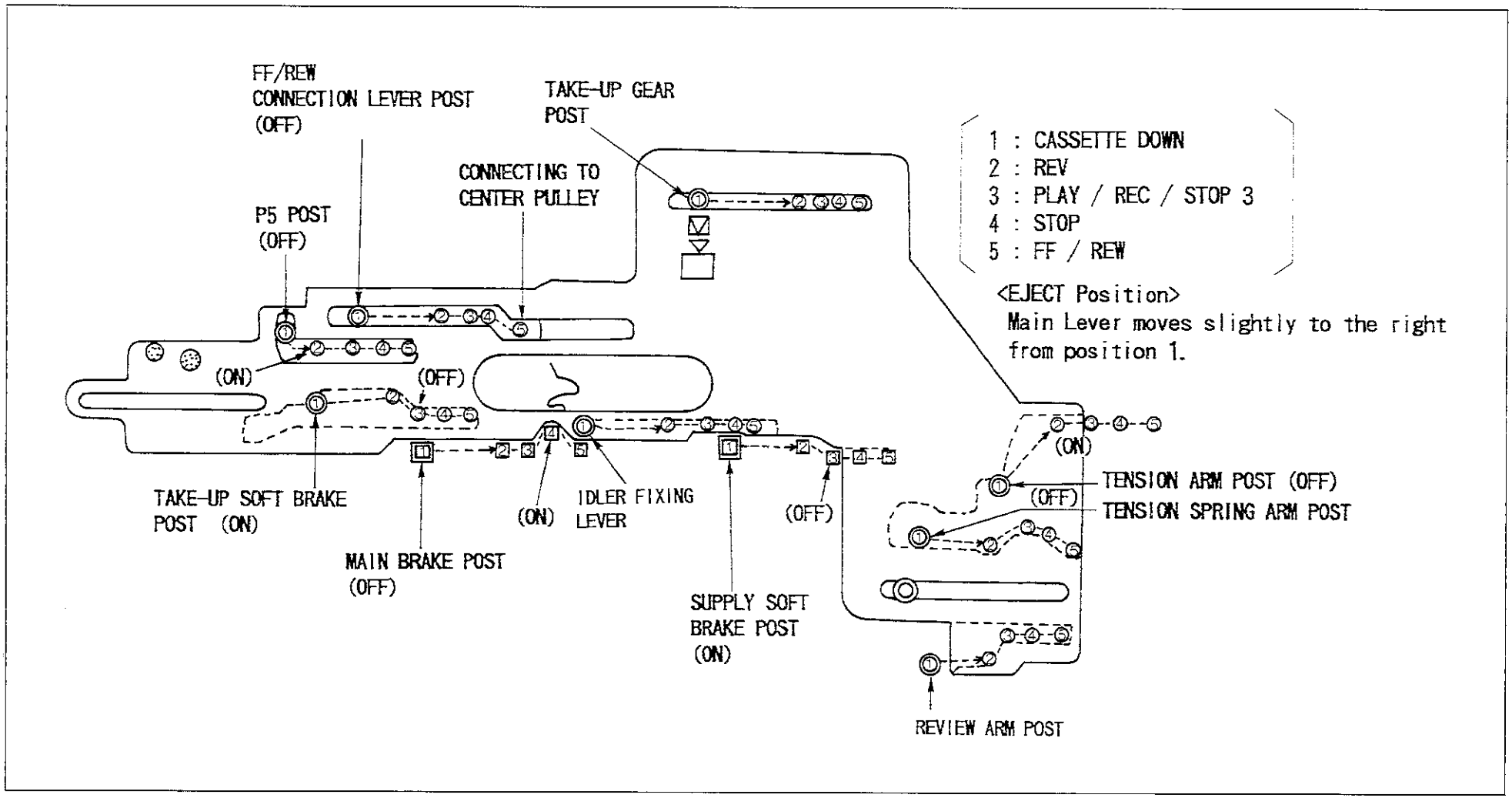


Fig. M7 Post and Main Lever Position in each Mode

1-1-3. Capstan Motor Mechanism Movement

There are 4 routes which drive power is transmitted from the capstan motor to the gears to perform mode operations as shown below.

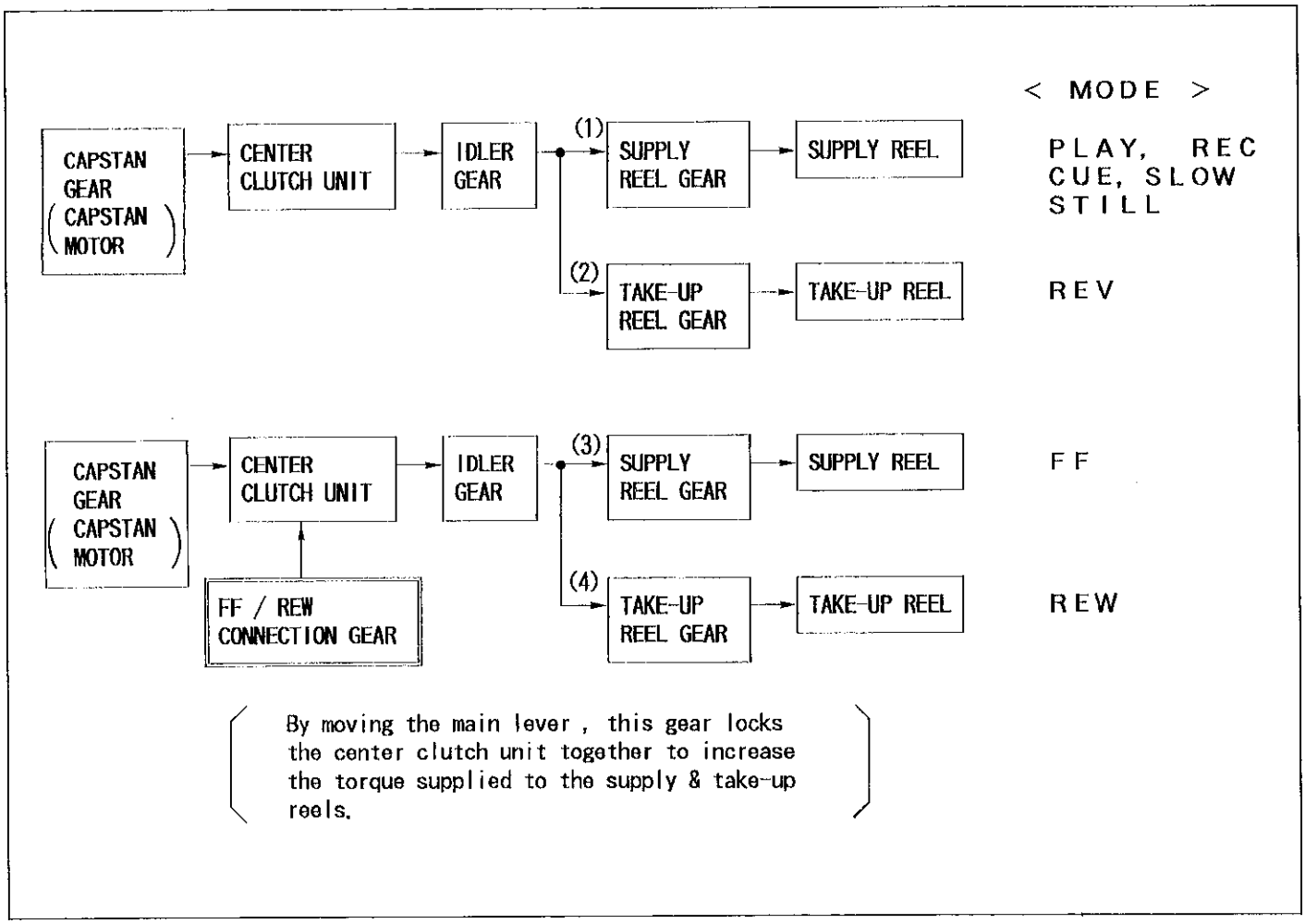


Fig. M8 Transmission Route of Gears in each Mode

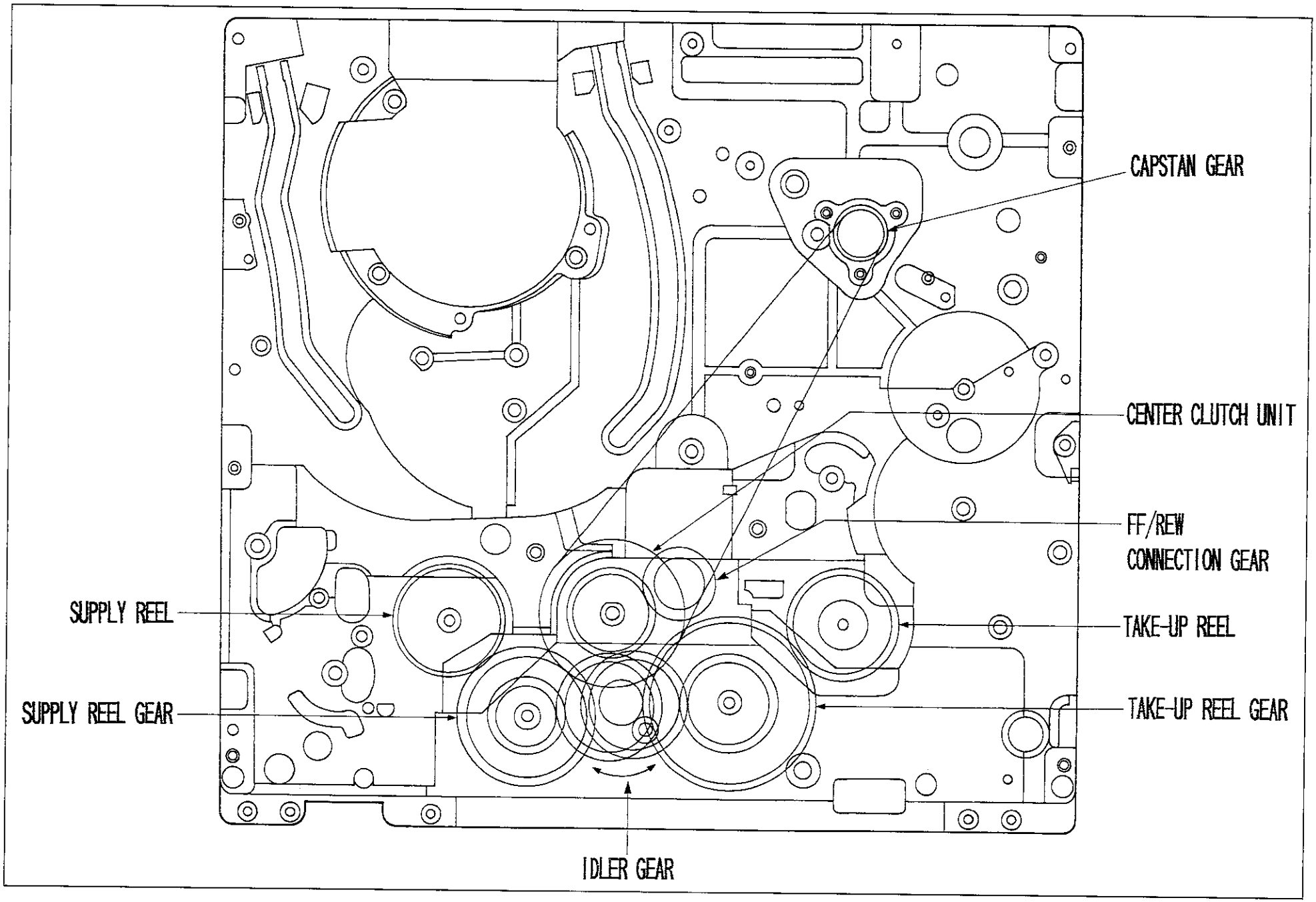


Fig. M9 Top View of Components Location

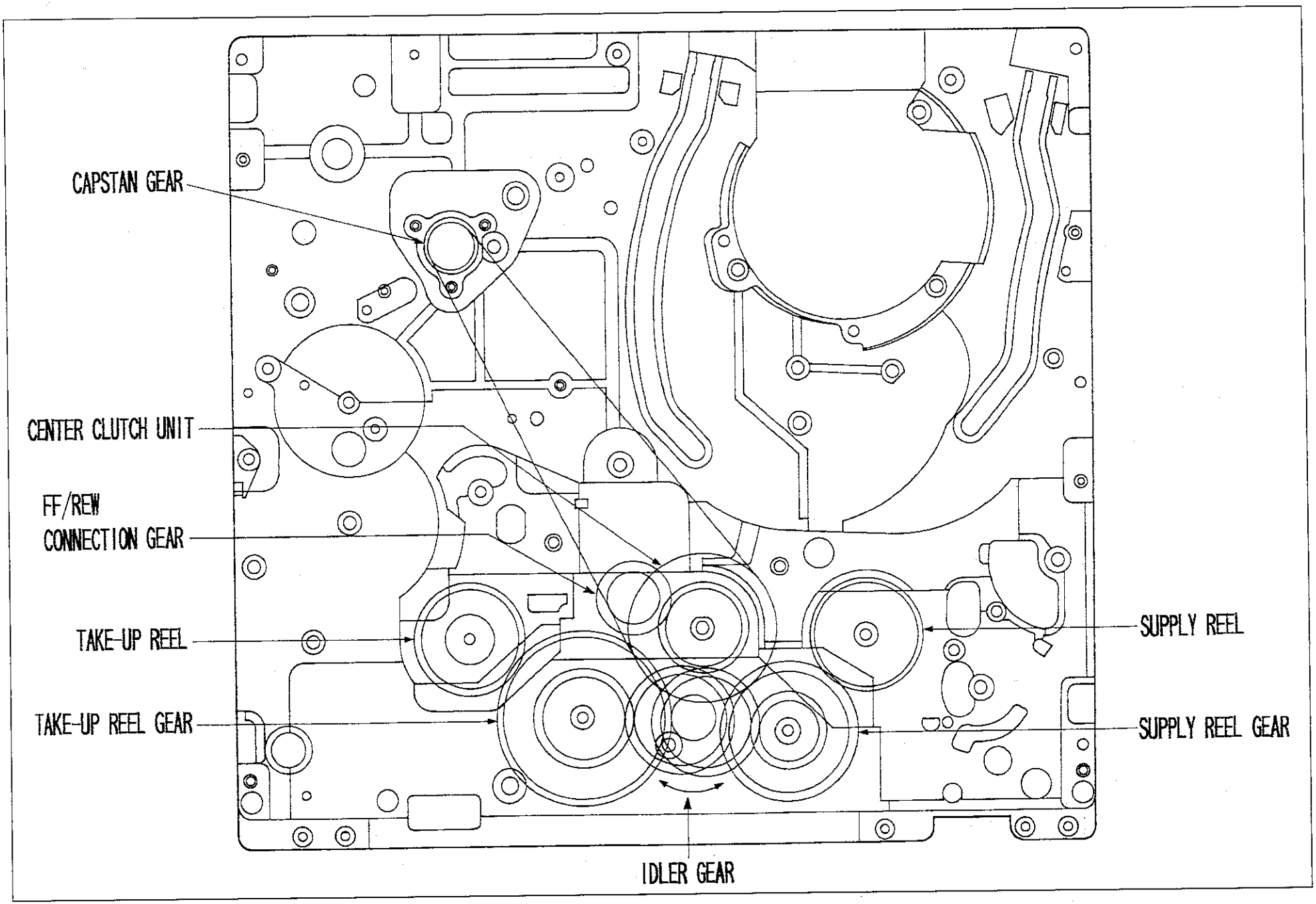


Fig. M10 Bottom View of Components Location

1-2. View of Phase Alignment

The gear phase alignment is perform in the cassette down position and is crucial for the K Mechanism to operate correctly.

(1) Top View of Gear Phase Alignment Marks.
There are alignment marks on the Pinch Cam Gear and Sub Cam Gear. There is one alignment mark on the carriage connection gear.

(2) Bottom View of Gear Phase Alignment Marks.
There are alignment marks on Take-up Loading Gear and Supply Loading Gear.
There is an additional mark on the Take-up Loading Gear that aligns with the mark on the main lever. There are alignment marks on the Main Cam Gear and the Sub Cam Gear. The mode switch gear mark aligns with a notch in the mode switch frame.

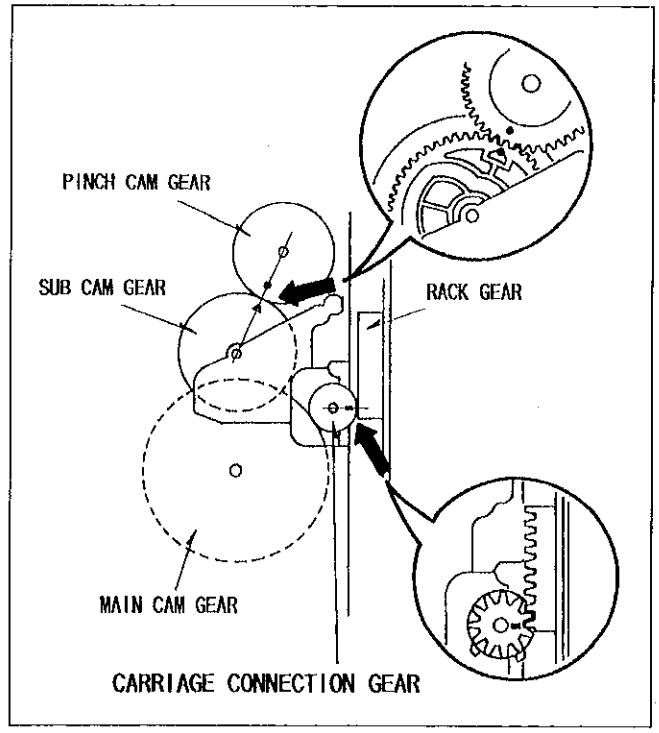


Fig. M11 Top View of Gear Phase Alignment

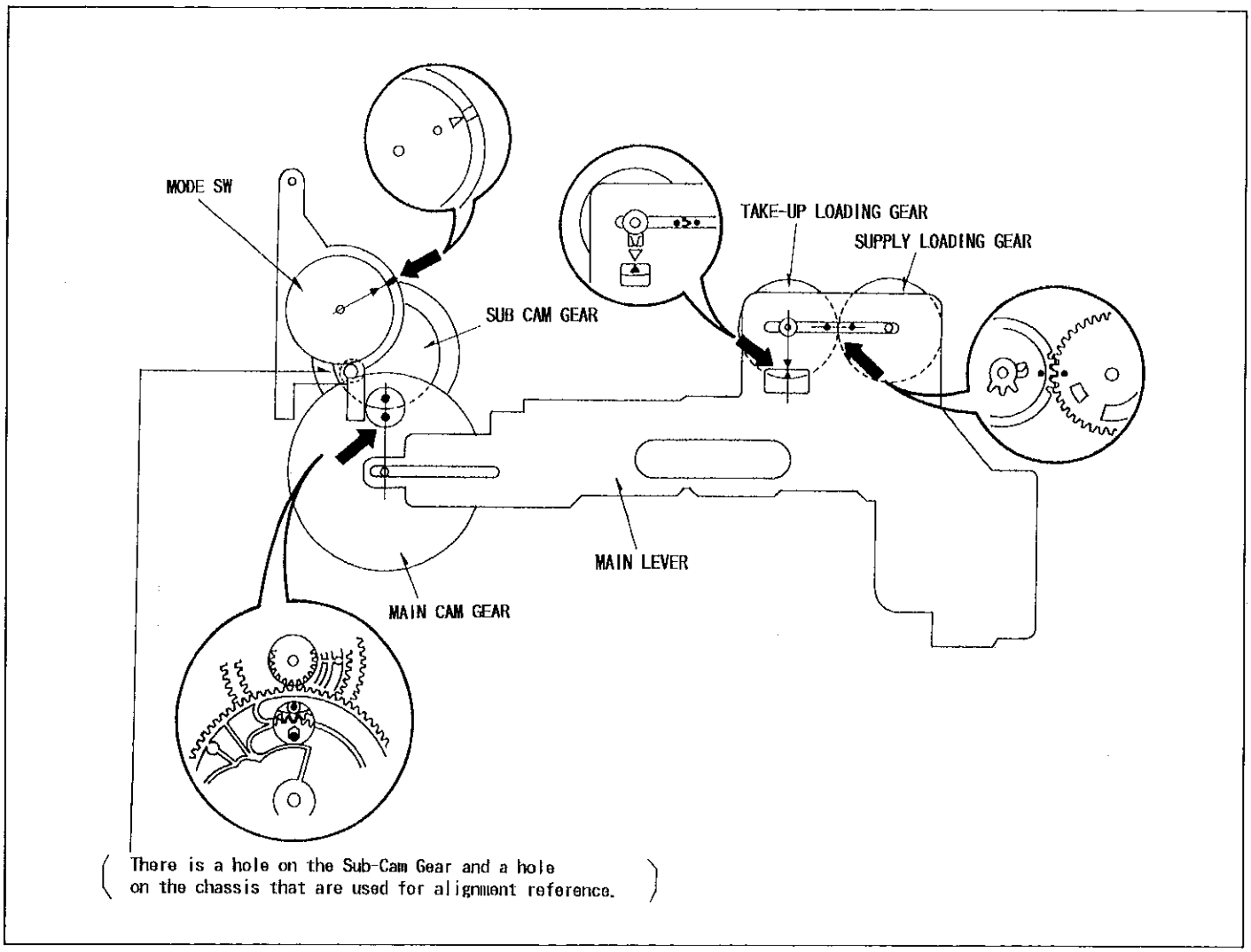

MODE SW
TAKE-UP LOADING GEAR
SUPPLY LOADING GEAR
SUB CAM GEAR
MAIN LEVER
MAIN CAM GEAR
There is a hole on the Sub-Cam Gear and a hole on the chassis that are used for alignment reference.

Fig. M12 Bottom View of Gear Phase Alignment

1-2-1. Phase Alignment in the Eject Position

When assembling a cassette carriage in an unit, align the phase as shown in Fig.M13.

(1) Phase alignment of Carriage Connection Gear

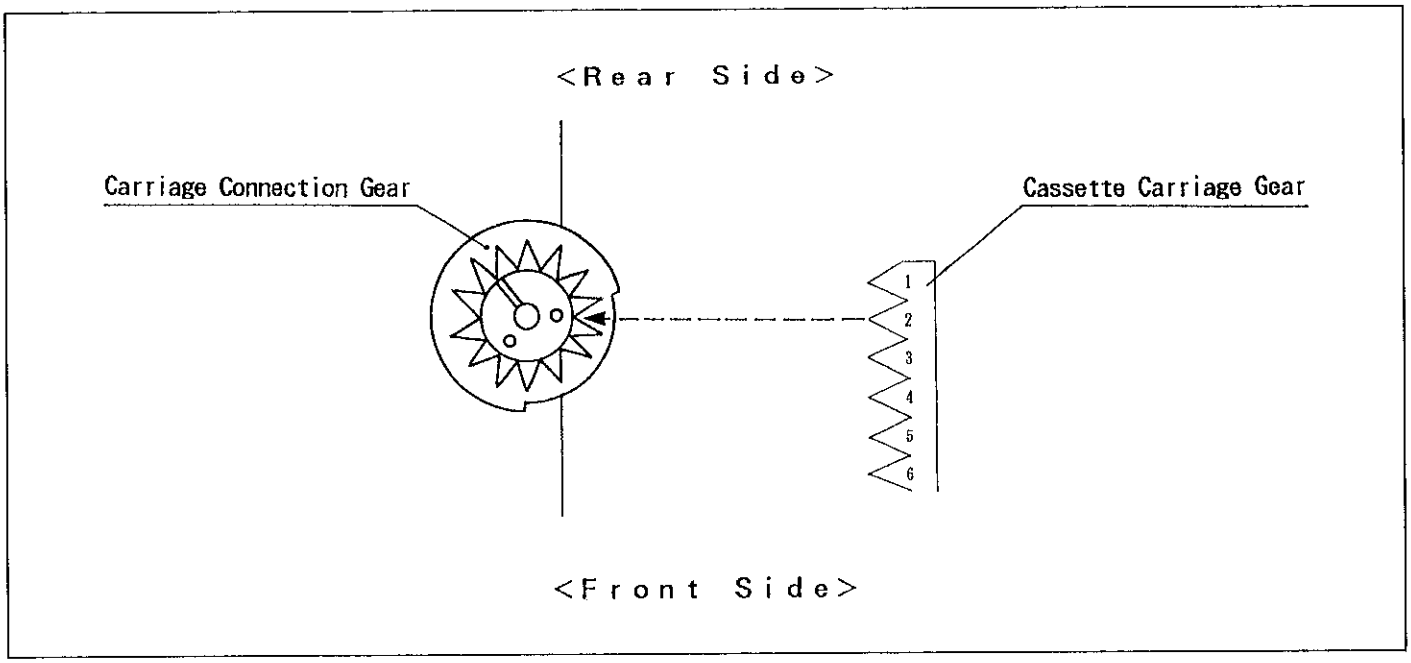


Fig. M13 Phase Alignment of Carriage Connection Gear

(2) Position of Mode Switch Arrow

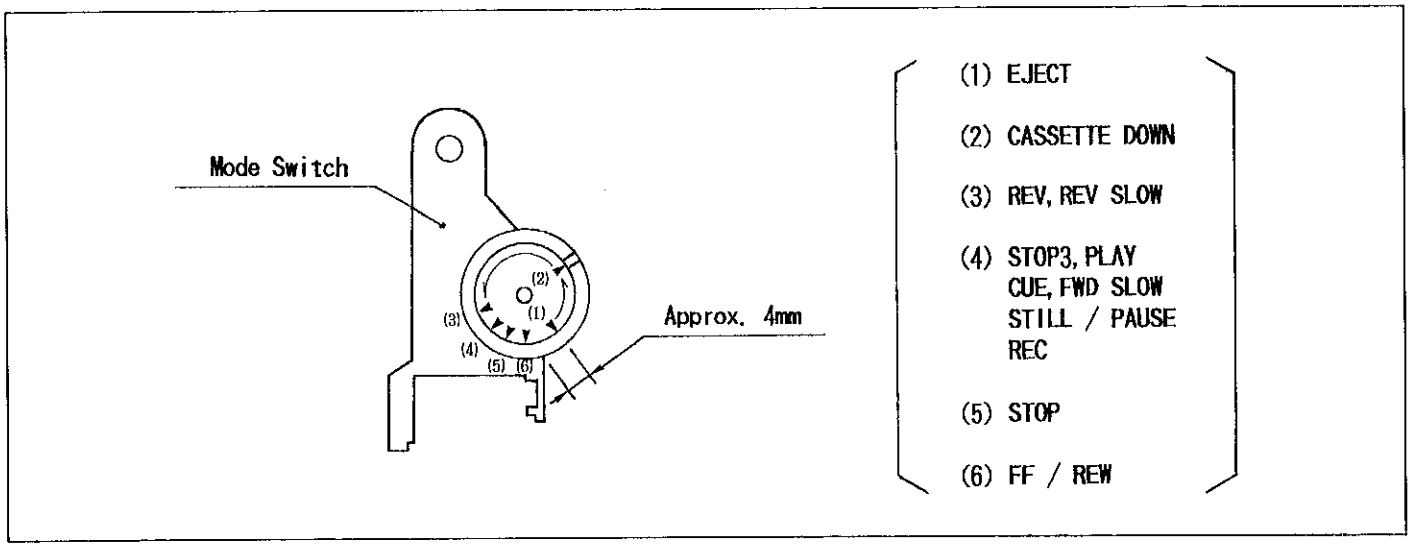


Fig. M14 Position of Mode Switch Arrow

1-3. Service Note

(1) Eject Operation

The mechanical Eject Operation works as shown in Fig.M15.

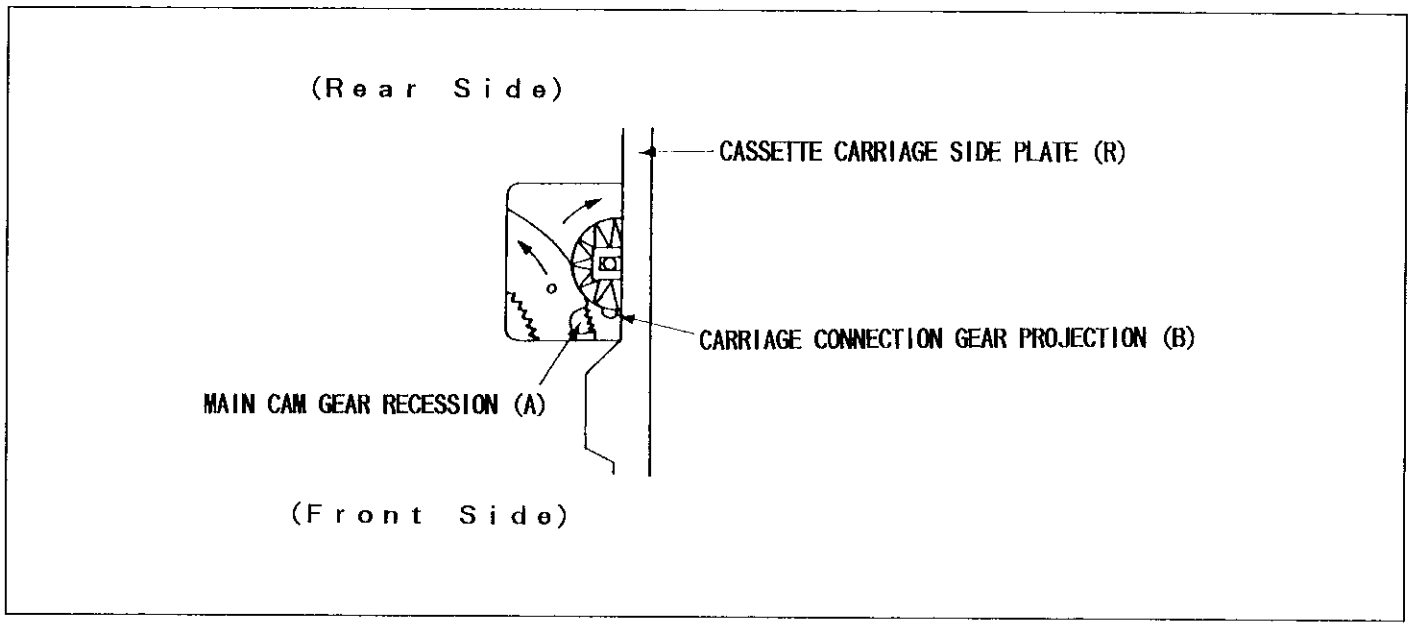


Fig. M15 Top View of Eject Operation

The main cam gear rotates in the direction of the arrow. The projection (B) of the carriage connection gear engages with the recession (A) of the main cam gear. The carriage connection gear rotates in the direction of the arrow to perform the Eject operation.

<NOTE>

If the Eject operation is performed without the cassette carriage installed while repairing or making the mechanical phase alignment, the main cam gear will not engage with the carriage connection gear and the carriage connection gear will not rotate.
For performing the Eject operation with the cassette carriage not installed, it is necessary to rotate to the carriage connection gear by hand in the direction of the arrow.

2. System Control

The new products such as NV-SD series employing K-Mechanism use a new microprocessor (Ref. No. IC6001 : MN67434VRRV / MN67434VRSA. The system control consists of 4 sections as follows.

(1) Serial Data Transmission
(2) Mechanism Control
(3) Safety
(4) Special Features and Controls

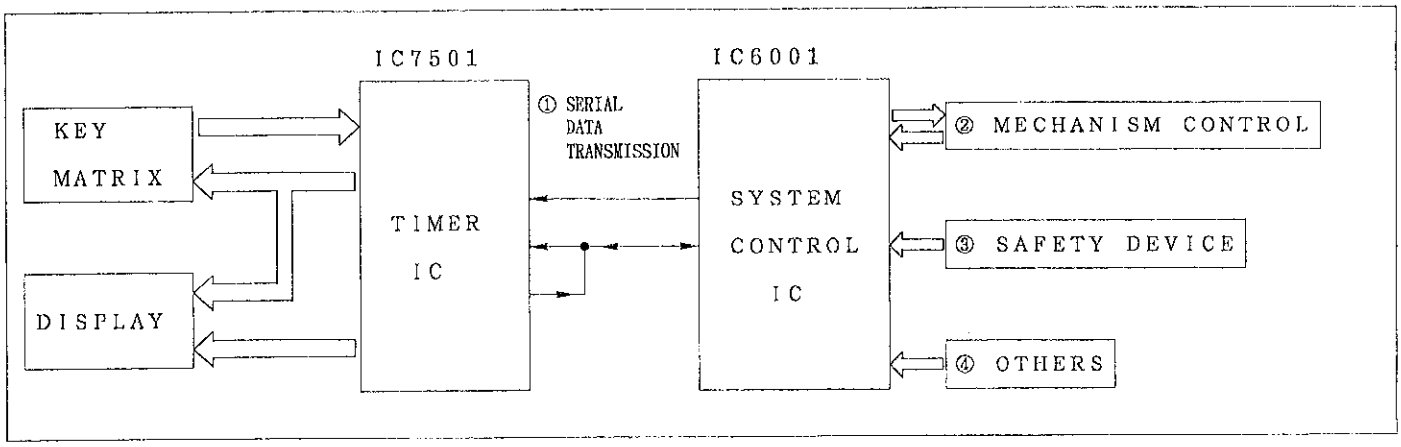


Fig. S1 Overall Block Diagram of System Control Circuit

2-1. SERIAL DATA TRANSMISSION CHART

The system control command data is transmitted as serial data to reduce the amount of transmission circuitry required. The format of serial data is shown in Fig.S2. A Serial clock is transmitted with the data for read timing reference.

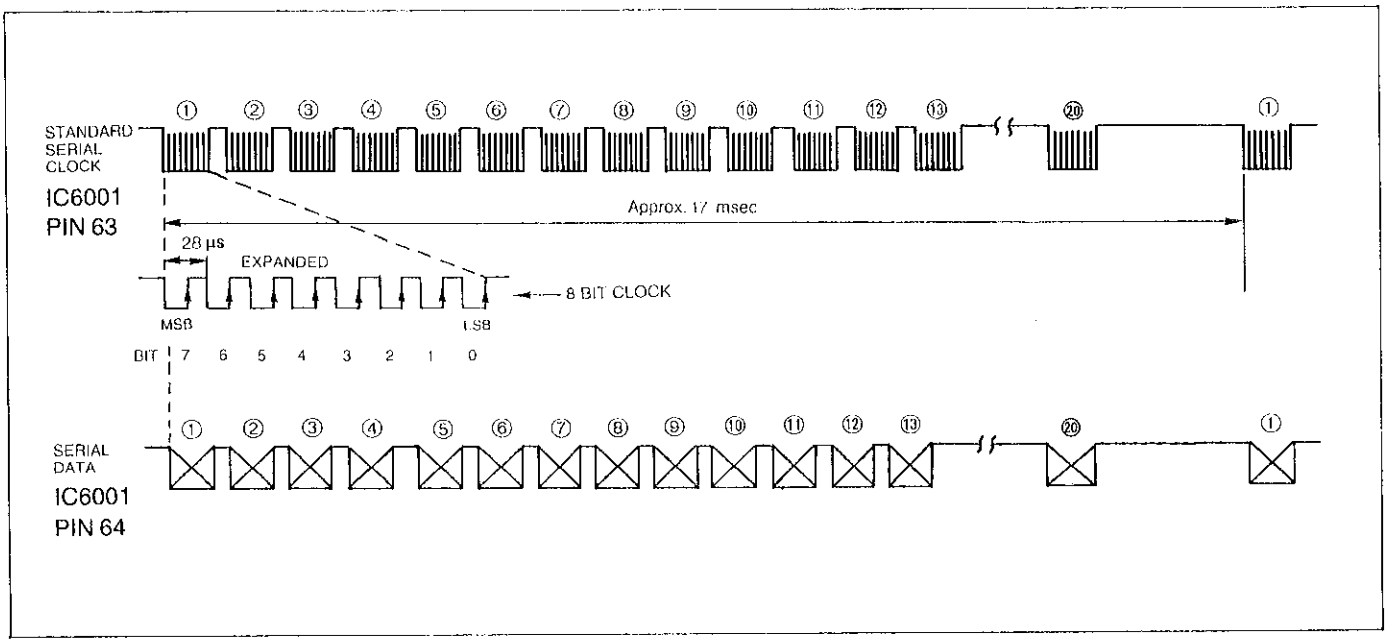


Fig. S2 Format of Serial Data and Clock

DATA NO.	DATA TRANSMISSION	CONTENTS OF DATA	DATA NO.	DATA TRANSMISSION	CONTENTS OF DATA
1	SYSTEM CONTROL IC6001 → TEMER IC7501	Tape Speed, Memory/Repeat/Search etc	11	SYSTEM CONTROL IC6001 → TEMER IC7501	Jog/VISS Code etc
2	TIMER IC7501 → SYSTEM CONTROL IC6001	Wireless Remoto & Key Control Code	12	SYSTEM CONTROL IC6001 → TEMER IC7501	Service Information Display etc
3	TIMER IC7501 → SYSTEM CONTROL IC6001	Timer Instructions code	13	SYSTEM CONTROL IC6001 → TEMER IC7501	OSD Code
4	Not Used		14	TIMER IC7501 → SYSTEM CONTROL IC6001	Jog/Shuttle Code
5	SYSTEM CONTROL IC6001 → TIMER IC7501	Deck Mode etc	15	Not Used	
6	SYSTEM CONTROL IC6001 → TIMER IC7501	Power ON/OFF, Cassette IN/OUT Code etc	16	Not Used	
7	SYSTEM CONTROL IC6001 → TIMER IC7501	Counter/Tape Remaining Code	17	Not Used	
8	SYSTEM CONTROL IC6001 → TIMER IC7501	Counter/Tape Remaining Code	18	Not Used	
9	SYSTEM CONTROL IC6001 → TIMER IC7501	Counter/Tape Remaining Code	19	Not Used	
10	TIMER IC7501 → SYSTEM CONTROL IC6001	Counter ON/OFF Tape Select Code etc	20	Not Used	

Fig. S3 Data Transmission Flow and Contents of Data

The contents of serial data transmission are shown in Fig.S4-1~13.

NO. 1 TRANSMISSION	INFORMATION	CONTENTS
BIT 7 & BIT 6	TAPE SPEED DISPLAY	BIT 7 / BIT 6 / DISPLAY 0 / 0 / 'SP' MARK DISPLAY 0 / 1 / 'LP' MARK DISPLAY 1 / 0 / 'SLP' MARK DISPLAY 1 / 1 / NO INDICATION
BIT 5 & BIT 4	COUNTER DISPLAY	BIT 5 / BIT 4 / DISPLAY 0 / 0 / TAPE REMAIN TIME DISPLAY 0 / 1 / DEW MODE DISPLAY 1 / 0 / PROGRAME MODE DISPLAY 1 / 1 / LINEAR COUNTER MODE DISPLAY
BIT 3 & BIT 2	(MEMORY/RESET/ SEARCH DISPLAY)	BIT 3 / BIT 2 / DISPLAY 0 / 0 / NO INDICATION 0 / 1 / NO INDICATION 1 / 0 / 'R' MARK DISPLAY 1 / 1 / 'S' MARK DISPLAY
BIT 1 & BIT 0	COUNTER TRANSMISSION DATA	BIT 1 / BIT 0 / DISPLAY 0 / 0 / TAPE REMAIN TIME 0 / 1 / DEW DATA 1 / 0 / PROG. NUMBER DATA 1 / 1 / LINEAR COUNTER DATA

Fig. S4-1 Serial Data No.1 (IC6001->IC7501)

TRANSMISSION NO. 2					
NO	FUNCTION	CODE BIT 7~BIT 0	NO	FUNCTION	CODE BIT 7~BIT 0
1	STOP	00000000	12	TAPE REMAINING	01010101
2	EJECT	00000001	13	AUTO TRACKING ON	10110000
3	REW(REVIEW)	00000010	14	TRACKING UP	10110001
4	FF(CUE)	00000011	15	TRACKING DOWN	10110010
5	STILL/PAUSE	00000110	16	RVS. PLAY	00001011
6	RECORD	00001000	17	INSERT	10110011
7	AUDIO DUBBING	00001001	18	AUDIO SELECT	00110011
8	PLAY	00001010	19	JOG ON	10000000
9	POWER ON/OFF	00111101	20	SERVICE MODE	11111100
10	ZERO STOP	11110101	21	MEMORY	01010011
11	COUNTER RESET	01010100			

Fig. S4-2 Serial Data No.2 (IC7501->IC6001)

<table>
<tr><th>NO. 3
TRANSMISSION</th><th>INFORMATION</th><th>CONTENTS</th></tr>
<tr><td>BIT 7</td><td>ANT OUT</td><td>
<table>
<tr><th>BIT 7</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>TV</td></tr>
<tr><td>1</td><td>VYR</td></tr>
</table>
</td></tr>
<tr><td>BIT 6</td><td>REMOTE CONTROLLER
SELECTION</td><td>
<table>
<tr><th>BIT 6</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>TIMER MODE</td></tr>
<tr><td>1</td><td>SYSTEM CONTROL MODE</td></tr>
</table>
</td></tr>
<tr><td>BIT 5
& BIT 4</td><td>TAPE SPEED
DATA FROM
SP/LP SELECT SW</td><td>
<table>
<tr><th>BIT 5</th><th>BIT 4</th><th>TAPE SPEED DATA</th></tr>
<tr><td>0</td><td>0</td><td>SP</td></tr>
<tr><td>0</td><td>1</td><td>LP</td></tr>
<tr><td>1</td><td>0</td><td>SLP(EP)</td></tr>
<tr><td>1</td><td>1</td><td>NOT USED</td></tr>
</table>
</td></tr>
<tr><td>BIT 3
~
BIT 0</td><td>TIMER
COMMAND
CODE</td><td>
<table>
<tr><th>BIT 3~BIT 0</th><th>COMMAND</th></tr>
<tr><td>0001</td><td>TIMER STAND-BY</td></tr>
<tr><td>0011</td><td>TIMER REC PAUSE</td></tr>
<tr><td>0101</td><td>TIMER REC</td></tr>
<tr><td>0111</td><td>OTR REC</td></tr>
</table>
</td></tr>
</table>

Fig. S4-3 Serial Data No.3 (IC7501->IC6001)

<table>
<tr><th>NO. 5
TRANSMISSION</th><th>INFORMATION</th><th>CONTENTS</th></tr>
<tr><td>BIT 7</td><td>SAFETY TAB
IS ATTACHED
OR NOT</td><td>
<table>
<tr><th>BIT 7</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>YES</td></tr>
<tr><td>1</td><td>NO</td></tr>
</table>
</td></tr>
<tr><td>BIT 6</td><td>CHANNEL
LOCK
(DELAYED REC)</td><td>
<table>
<tr><th>BIT 6</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>NO CHANNEL LOCK</td></tr>
<tr><td>1</td><td>CHANNEL KOCK</td></tr>
</table>
</td></tr>
<tr><td>BIT 5</td><td>EE / VV
DATA</td><td>
<table>
<tr><th>BIT 5</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>EE</td></tr>
<tr><td>1</td><td>VV</td></tr>
</table>
</td></tr>
<tr><td>BIT 4</td><td>PROCESS
FLAG</td><td>
<table>
<tr><th>BIT 4</th><th>INFORMATION</th></tr>
<tr><td>0</td><td>NOT USED</td></tr>
<tr><td>1</td><td>DURING MODE TRANSIT</td></tr>
</table>
</td></tr>
<tr><td>BIT 3
~
BIT 0</td><td>DECK MODE</td><td>
<table>
<tr><th>MODE</th><th>CODE</th><th>MODE</th><th>CODE</th></tr>
<tr><td>STOP</td><td>0000</td><td>PLAY</td><td>1000</td></tr>
<tr><td>EJECT</td><td>0001</td><td>STILL</td><td>1001</td></tr>
<tr><td>REW</td><td>0010</td><td>REC</td><td>1010</td></tr>
<tr><td>FF</td><td>0011</td><td>REC PAUSE</td><td>1011</td></tr>
<tr><td>REV</td><td>0100</td><td>AUDIO DUBBING</td><td>1100</td></tr>
<tr><td>CUE</td><td>0101</td><td>A. DUB PAUSE</td><td>1101</td></tr>
<tr><td>SLOW</td><td>0110</td><td>INSERT</td><td>1110</td></tr>
<tr><td>POWER OFF</td><td>0111</td><td>INSERT PAUSE</td><td>1111</td></tr>
</table>
</td></tr>
</table>

Fig. S4-4 Serial Data No.5 (IC6001->IC7501)

NO. 6 TRANSMISSION	INFORMATION	CONTENTS	
		0	1
BIT 7	FLAG	NORMAL SPEED FLAG	DOUBLE SPEED FLAG
BIT 6	POWER FLAG	POWER OFF	POWER ON
BIT 5	CASSETTE IN/OUT	CASSETTE OUT	CASSETTE IN
BIT 4	NOT USED		
BIT 3	BUZZER	SOUND	NO SOUND
BIT 2	REVERSE PB FLAG	NORMAL PB	REVERSE PB
BIT 1	COMPULSIVE COUNTER DISPLAY	NORMAL DISPLAY	COMPULSIVE COUNTER DISPLAY
BIT 0	SLOW FLAG	DURING MODE TRANSIT TO SLOW MODE	NORMAL PB

Fig. S4-5 Serial Data No.6 (IC6001->IC7501)

NO. 7 TRANSMISSION	INFORMATION
BIT 7~BIT 0	HOUR DISPLAY

Fig. S4-6 Serial Data No.7 (IC6001->IC7501)

NO. 8 TRANSMISSION	INFORMATION
BIT 7~BIT 0	MINUTE DISPLAY

Fig. S4-7 Serial Data No.8 (IC6001->IC7501)

NO. 9 TRANSMISSION	INFORMATION
BIT 7~BIT 0	SECOND DISPLAY

Fig. S4-8 Serial Data No.9 (IC6001->IC7501)

NO. 10 TRANSMISSION	INFORMATION	CONTENTS	
		0	1
BIT 7	COUNTER DISPLAY	EXCEPT COUNTER DISPLAY	DURING COUNTER DISPLAY
BIT 6	NOT USED		
BIT 5 & BIT 4	TAPE SELECTION		

BIT 5	BIT 4	MODE	
		NTSC	PAL
0	0	~T120	E195
0	1	T140~T180	E240
1	0	NOT USED	E260
1	1	NOT USED	

BIT 3 & BIT 0	NOT USED

Fig. S4-9 Serial Data No.10 (IC7501->IC6001)

NO. 11 TRANSMISSION	INFORMATION	CONTENTS	
		0	1
BIT 7	TIME SEARCH	ON	OFF
BIT 6	VISS MODE	INDICATION	NO INDICATION
BIT 5	BLANK SEARCH	ON	OFF
BIT 4	INTRO SEARCH	ON	OFF
BIT 3	VISS WRITE	INDICATION	NO INDICATION
BIT 2	VISS ERASE	INDICATION	NO INDICATION
BIT 1	LAP TIME	INDICATION	NO INDICATION
BIT 0	JOG	INDICATION	NO INDICATION

Fig. S4-10 Serial Data No.11 (IC6001->IC7501)

NO. 12 TRANSMISSION	INFORMATION	CONTENTS	
		0	1
BIT 7	SERVICE INFORMATION DISPLAY	INDICATION	NO INDICATION
BIT 6	INSERT AND DUB. DISPLAY	"INSERT" and "DUB" MARK DISPLAY	NO INDICATION
BIT 5 & BIT 4	FRAME NUMBER DISPLAY	LEFT DIGIT OF FRAME NUMBER	
BIT 3 ~ BIT 0	FRAME NUMBER DISPLAY	RIGHT DIGIT OF FRAME NUMBER	

Fig. S4-11 Serial Data No.12 (IC6001->IC7501)

No. 13 TRANSMISSION	INFORMATION	CONTENTS
BIT 7 ~ BIT 5	OSD DISPLAY COMMAND	BIT 7 / BIT 6 / BIT 5 / COMMAND 1 / 1 / 1 / NO INDICATION 1 / 0 / -- / TRACKING DISPLAY 0 / 1 / 1 / REC/PAUSE, TIME DISPLAY 0 / 0 / 1 / TAPE REMAINING DISPLAY 0 / 0 / 0 / NO INDICATION 1 / 1 / 0 / OSD DISPLAY INHIBITION
BIT 4 ~ BIT 0	DISPLAY MODE DATA	DISPLAY DATA FROM MODE

Fig. S4-12 Serial Data No.13 (IC6001->IC7501)

TRANSMISSION No. 14					
No	FUNCTION	CODE BIT 7 → BIT 0	No	FUNCTION	CODE BIT 7 → BIT 0
1	JOG ON	10000000	11	X - 1	10000100
2	NO OPERATION	11111111	12	X 1	10000101
3	FORWARD SLOW	00001100	13	REV 1	10000110
4	REVERSE SLOW	00001101	14	CUE 1	10000111
5	X - 1/30	10010110	15	REV 2	10001000
6	X 1/30	10010111	16	CUE 2	10001001
7	X - 1/10	10011000	17	REV 3	10001100
8	X 1/10	10011001	18	CUE 3	10001101
9	X - 1/5(SHUTTLE)	10000001	19	X - 1/5(JOG)	10001010
10	X 1/5(SHUTTLE)	10000011	20	X 1/5(JOG)	10001011

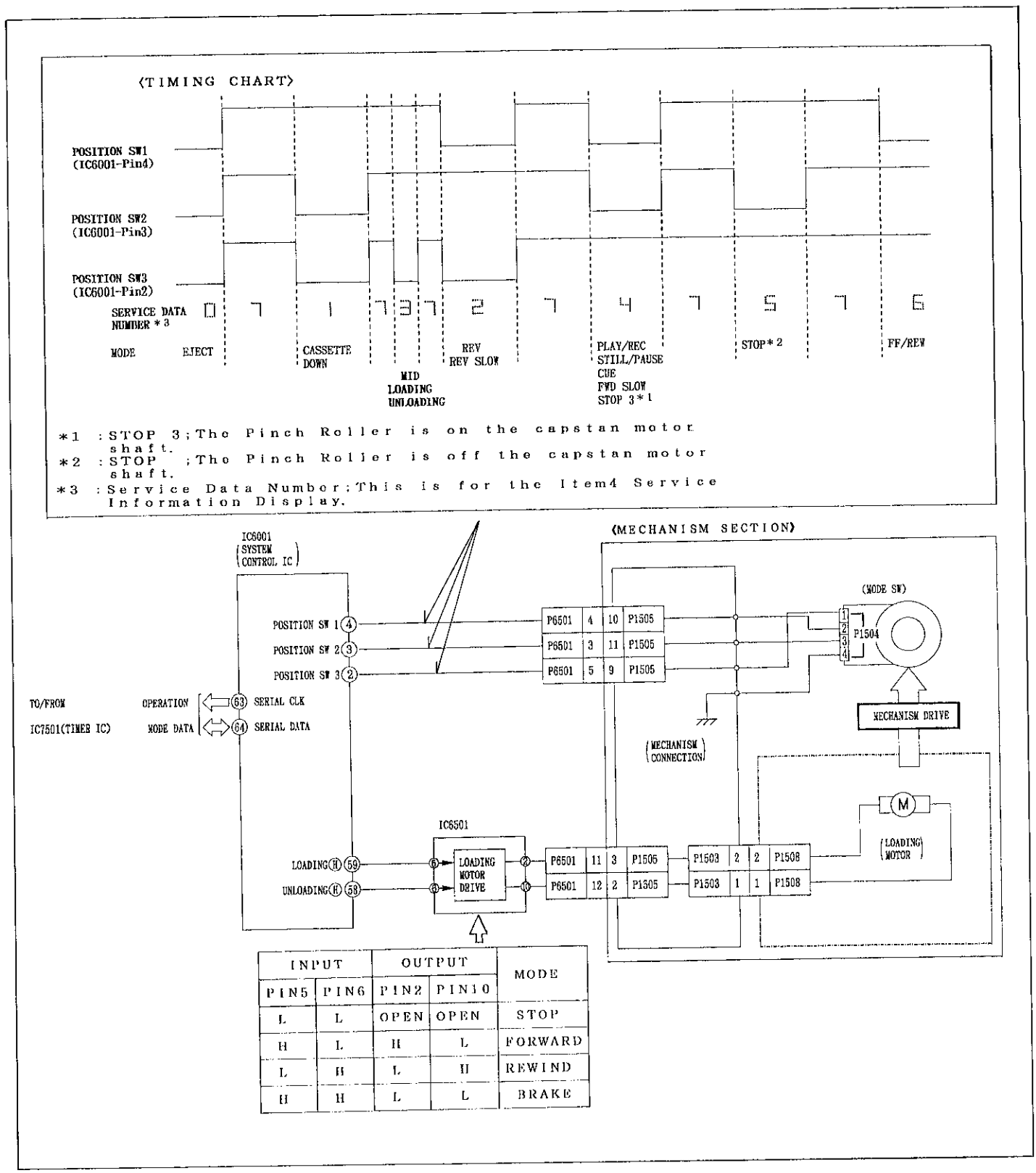
Fig. S4-13 Serial Data No.14 (IC7501->IC6001)

2-2. Mechanism Control Circuit

All mechanism movement except the reel rotation is driven by the loading motor. The microprocessor IC6001 controls the mechanism by controlling the loading motor. The Mode SW sends mechanism position information to the IC6001.

< Example of Mechanism Control in FF Mode >

(1) When pressing FF mode button, the command data is transmitted from IC7501 (TIMER IC) to IC6001 to drive the loading motor.
(2) The loading motor drives the mechanism components to the FF mode position.
(3) The Mode SW sends the mechanism position information.
(POSITION SW 1 : POSITION SW 2 : POSITION SW 3 : = L : H : H) to IC6001.



INPUT		OUTPUT		MODE
PIN5	PIN6	PIN2	PIN10	
L	L	OPEN	OPEN	STOP
H	L	H	L	FORWARD
L	H	L	H	REWIND
H	H	L	L	BRAKE

Fig. S5 Mechanism Control Circuit

2-2-1. Cassette-Insert Detection

The cassette up/down position is detected by the take-up photo transistor Q1501. When the cassette tape is inserted into the cassette carriage, the light from Sensor LED D1501 to Q1501 is cut by the right side of cassette. Then, the cassette tape goes to the cassette down position.

2-3. Safety Circuit

The microprocessor IC6001 detects conditions that might cause damage to the tape or mechanism. When such a condition is detected, the IC6001 will prevent further operation.

2-3-1. Cylinder Lock

The IC6001 uses the head switching signal produced from FG/PG signals (IC6001-Pin43 Input) to sense cylinder lock. If the head switching signal is not received due to cylinder lock during the recording or playback, the microprocessor IC6001 places the VCR in the Stop mode. During the timer recording, it turns the VCR power Off.

2-3-2. Loading & Unloading Mechanism Lock

The mechanism lock is determined by the IC6001 not not receiving the correct mechanism position information from the mode switch. If the mechanism locks during the loading operation, the tape is unloaded and the cassette is ejected. If the mechanism locks during the unloading operation, the power is turned Off.

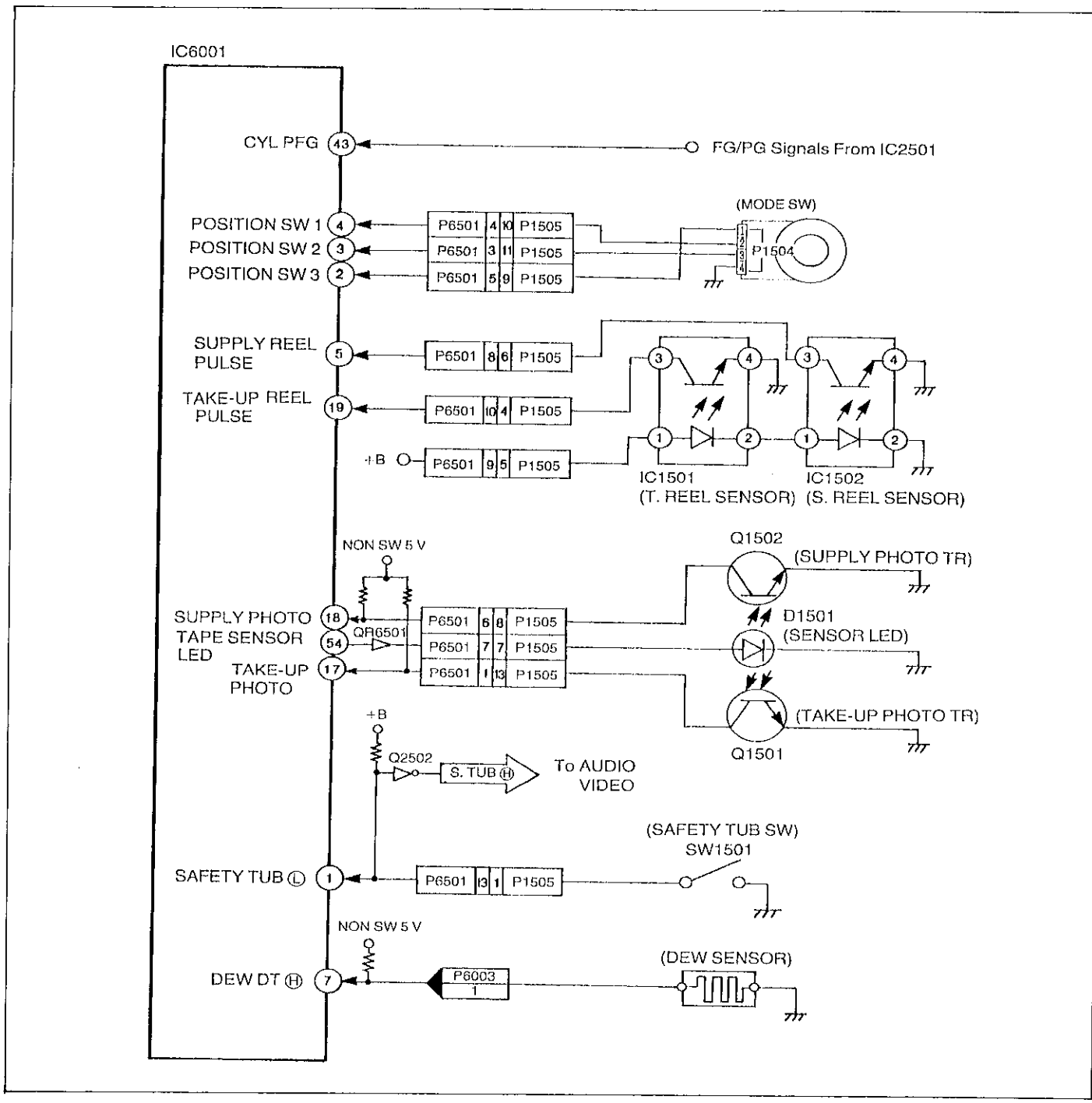


Fig. S6 Safety Circuit

2-3-3. Cassette Loading & Unloading Lock

(1) If the mechanism locks during the cassette-in operation, the cassette is ejected.
(2) If the mechanism locks during the cassette eject operation the mechanism performs the cassette-in operation and retries the cassette eject operation. If the mechanism locks again the power is turned Off.

2-3-4. Reel Sensor

The reel sensor (IC6001-Pin(5),(19)) detects a pulse generated by the Supply and Take-up reels to determine if reels are rotating. If the reel rotation is not smooth, the microprocessor places the VCR in the Stop mode to prevent tape damage.

2-3-5. Supply and Take-up Sensors

Supply and take-up photo transistors are used to sense the beginning and end of a tape. The tape has transparent leaders at the beginning and end. When these transparent leaders enter the tape transport path, they allow infrared light from the sensor LED to reach either one of the tape end sensors (photo-transistor). If the take-up end sensor detects the light, the microprocessor IC6001 places the VCR in the Stop mode and then performs a short cue. If the supply end sensor is triggered, the microprocessor activates the Stop mode and the Rewind mode. The Rewind mode continues until the take-up end sensor detects the end of the tape. The tape beginning is detected by a low signal at IC6001 pin(17). The tape end is detected by a low signal at IC6001 pin(18). If light is received at both sensors at same time the cassette is ejected.

2-3-6. Safety Tab Switch

A recorded video cassette can be protected against accidental erasure by breaking off the tab on the cassette. The cassette can now only be used for playback. To be able to record on the cassette, cover the hole with adhesive tape. If the safety tab on the cassette has been removed, the Safety Tab Switch is off(open) and a high signal is supplied to pin 1 of IC6001. The IC6001 will not go into the Recording mode and automatically places the VCR in the Playback mode.

2-3-7. Dew Sensor

If excessive moisture or condensation is present inside the machine (an internal humidity of more than 98%) the unit will stop if running. Until the moisture level decreases only the Eject mode will operate. To sense the humidity, a dew sensor is used. The sensor is a special variable resistor which changes resistance with ambient humidity. The sensor ranges in resistance from about 5k ohm at 90% humidity to about 50k ohm at 98% humidity. Normally, the voltage across the sensor is low because of its low resistance. But if moisture condenses inside the unit, the voltage of pin7 of IC6001 increases to indicate a Dew condition.

2-4. Special Features and Controls

2-4-1. STOP 3 Specifications

a) The STOP 3 is the playback standby mode.
b) The unit is put into the STOP 3 position after tape loading if the cassette tape does not have a clear loader tape.
c) If the unit is in the STOP 3 position when the power is switched off (including the timer a standby mode), the unit goes to the STOP position.
d) If a cassette is in the unit when the power is turned on, the unit goes to the STOP 3 position.

2-4-2. Standby in the STOP 3 Position

a) The unit goes to the STOP 3 position if the STOP mode is selected during the PLAY or REC operations. The unit then loosens the tape tension by performing the Reverse Still Advance. The Reverse Still Advance corresponds to the FG 40 pulses of the capstan (irrespective of SP/EP modes). The cylinder continues to rotate.
b) After about 10 minutes in the STOP 3 mode, the unit shifts to the STOP position and the cylinder continues rotating.
c) After another 10 minutes, the unit stops the cylinder rotation.

2-4-3. Remaining Tape Time Calculation in FF/REW mode

a) If the calculation of the remaining tape time is not completed before the FF or REW operation starts, the unit runs the tape by the CUE or REV operation to calculate the remain tape time.

2-4-4. CUE/REV Search

Operation on the unit control panel.
a) If the SHUTTLE Ring is rotated and released in less than 0.7sec during the playback mode (while playback picture appears), the unit is put into the CUE/REV lock mode. If the SHUTTLE Ring is kept rotated longer than 0.7sec., the unit will return to the PLAY mode when the SHUTTLE Ring is released.

2-4-5. FR (Forward/Reverse) Search

Operation on the unit control panel.
a) If the SHUTTLE Ring is kept rotated during FF or REW, the unit is put into the CUE or REV mode.
b) When the SHUTTLE Ring is released, the unit returns to the FF or REW mode.

(Operation with the Remote Controller)
a) If the FF or REW Key is kept depressed during FF or REW, the unit is put into the CUE or REV mode.
b) When the FF or REW Key is released, the unit turns to the FF or REW mode.

2-4-6. Input/Output Chart for IC6001
(Part No.: MN67434VRRV / MN67434VRSA)

<table>
<tr><th>Pin Number</th><th>Input/Output</th><th>Port Name</th><th>Function</th></tr>
<tr><td>1</td><td>I</td><td>SAFETY-TAB</td><td>When inserting the cassette tape with safety tab, this port is low. When there is no safety tab, this port is high to prevent recording.</td></tr>
<tr><td>2
3
4</td><td>I
I
I</td><td>POSITION SW 3
POSITION SW 2
POSITION SW 1</td><td>
<table>
<tr><th>P. SW 3</th><th>P. SW 2</th><th>P. SW 1</th><th>Position (Mode) Name</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>EJECT</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>CASSETTE DOWN</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>REV, REV SLOW</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>MID(LOADING / UNLOADING)</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>PLAY/REC, STILL/PAUSE, CUE, FWD SLOW STOP3*1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>STOP</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>FF / REW</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>INTERMEDIATE</td></tr>
</table>
(*1) The Pinch Roller is on the capstan motor shaft.
</td></tr>
<tr><td>5</td><td>I</td><td>SUPPLY REEL PULSE</td><td>Sepply Reel Pulse Input
(For detecting tape remaining)</td></tr>
<tr><td>6</td><td>I</td><td>NORMAL/SERVICE /TEST</td><td>Service Mode Setting
Normal Mode : High
Service Mode : Middle
Test Mode : Low</td></tr>
<tr><td>7</td><td>I</td><td>DEW</td><td>When Dew is detected, this port is middle.
Normally, this port is low.</td></tr>
<tr><td>8</td><td>I</td><td>TEST</td><td>Not used (Low setting)</td></tr>
<tr><td>9</td><td>I</td><td>ENVELOPE SELECT</td><td>The playback envelope video signal level is detected at this input to select the video head in the special special playback modes.</td></tr>
<tr><td>10</td><td>O</td><td>ROTARY SW</td><td>This signal is supplied to the chrominance circuit to perform the phase rotation.</td></tr>
<tr><td>12</td><td>O</td><td>HEAD AMP SWITCH</td><td>This signal is supplied to the head amp circuit to switch the video head, SP or LP.</td></tr>
<tr><td>14</td><td>O</td><td>ARTIFICIAL V / H / N</td><td>Artificial Vortical Sync Signal is supplied to video circuit to stabilize the picture in the special playback modes.</td></tr>
<tr><td>17</td><td>I</td><td>TAKE-UP PHOTO</td><td>Take-up Side Photo Sensor Input
(For detecting tape beginning)</td></tr>
<tr><td>18</td><td>I</td><td>SUPPLY PHOTO</td><td>Supply Side Photo Sensor Input (For detecting tape end.)</td></tr>
</table>

Pin Number	Input/Output	Port Name	Function
19	I	TAKE-UP REEL	Take-up Reel Pulse Input (For detecting tape remaining and reel (Cap.)lock.)
20	O	SP / LP	Tape Speed Output SP : Low LP : High
47	O	VTR(H)	VTR / TV Switch Output VTR : High TV : Low
48	O	SP(H)	Tape Mode Output SP : High LP : Low
54	O	SENSOR LED ON (L)	When turning on the Sensor LED, this port is low. 1) STOP Mode : No lit. 2) FF, REW, CUE, REV Modes : DC is lit. 3) EJECT Mode : Pulse blinking. (Cycle:320[msec])
55	O	VOLTAGE CHANGE (H)	When increasing the drive torgue of loading motor to perform the FF/REW mode, this port is low.
58	O	UNLOADING (H)	When unloading, this port is high.
59	O	LOADING (H)	When loading, this port is high.
63	O	SERIAL CLOCK	Serial Clock Output
64	I/O	SERIAL DATA	Serial Data In/Out
66	O	DELAYED REC(H)	When the video goes to the recording mode after a delay from the video recording command, this port is high.
67	O	DELAYED AUDIO REC (H)	When the audio goes to the recording mode after a delay from the audio recording command, this port is high.
68	O	FULL ERASE (H)	When the video goes to the recording mode, this port is high.
69	O	REC (H)	When the video goes to the recording mode, this port is high.
70	O	NTSC (L)	System Output NTSC : Low PAL : High
71	O	AUDIO MUTE (H)	When the audio goes to the mute mode, this is high.
72	O	CAPSTAN REVERSE (H)	When the capstan motor rotates in reverse, this is high.
73	O	AUDIO EE (H)	When the audio goes to the EE mode, this is high.

Pin Number	Input/Output	Port Name	Function
75	O	CURRENT EMPHASIS (H)	When the servo goes to the edit mode, this is high.
76	O	FF/REW (L)	When the servo goes to the FF/REW mode, this is low.
78	O	VIDEO EE (L)	When the video goes to the EE mode, this is low.
79	O	TRICK (L)	When the video goes to the special playback (CUE, REV, SLOW, STILL) mode, this is low.
80	O	POWER OFF (H)	Power ON/OFF Control is low when the power switch is turned on.
84	I	RESET (L)	When reseting the IC6001, this port is low.

2-5. Mechanical Mode Operation

Refer to Item 2-2. Mechanism control circuit.

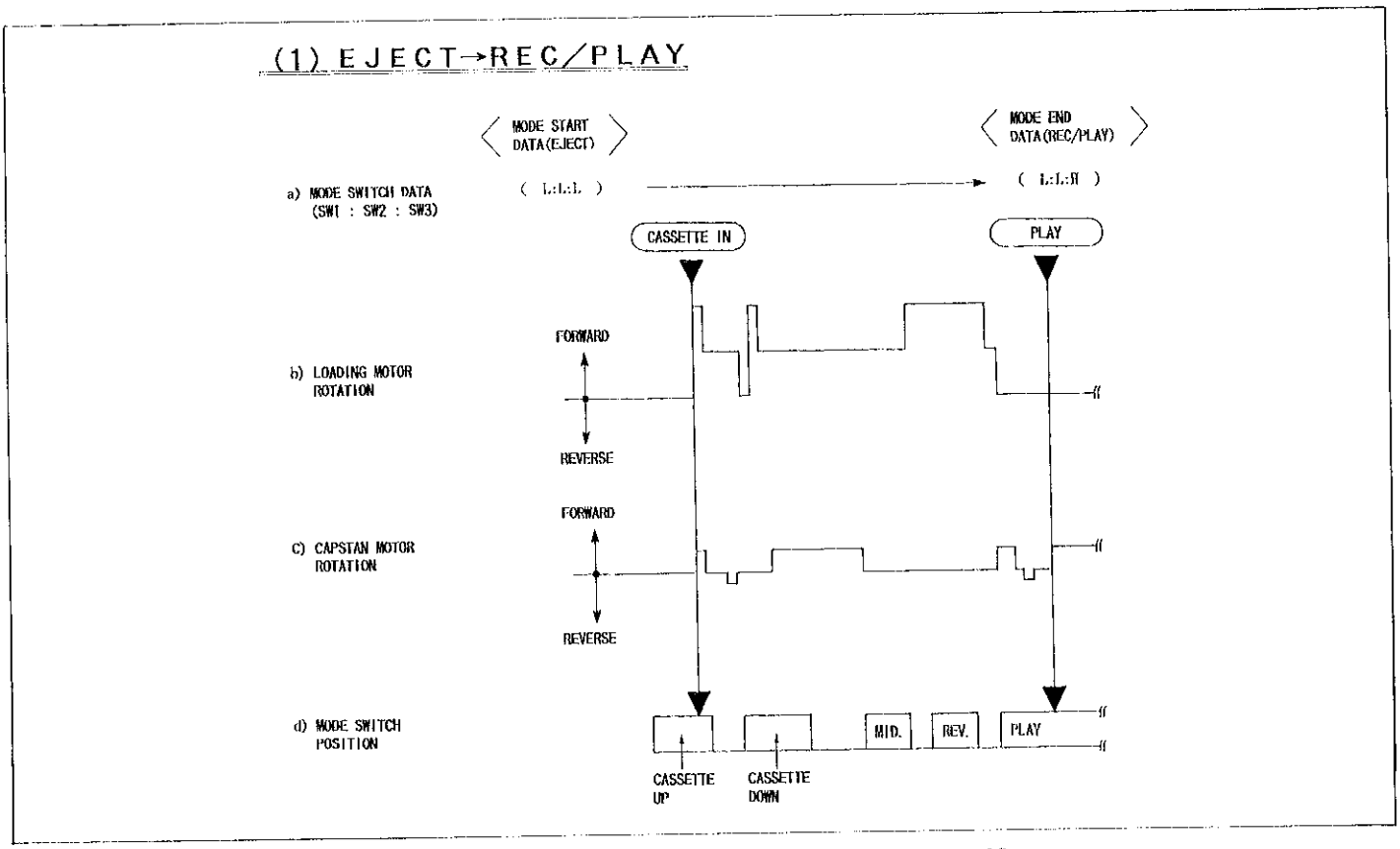


Fig. S7 Mechanical Mode Operation From Eject TO REC/PLAY

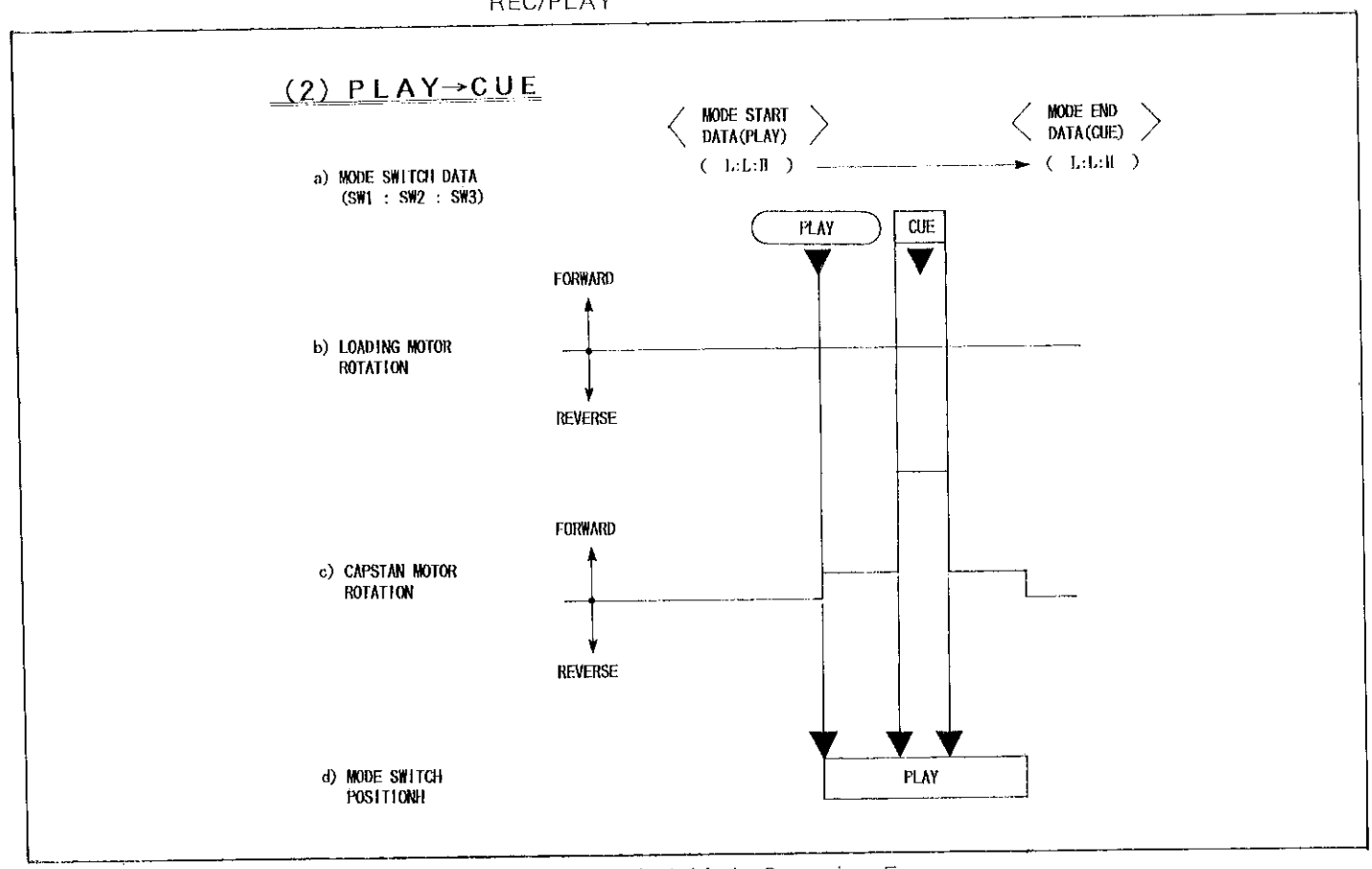


Fig. S8 Mechanical Mode Operation From PLAY TO CUE

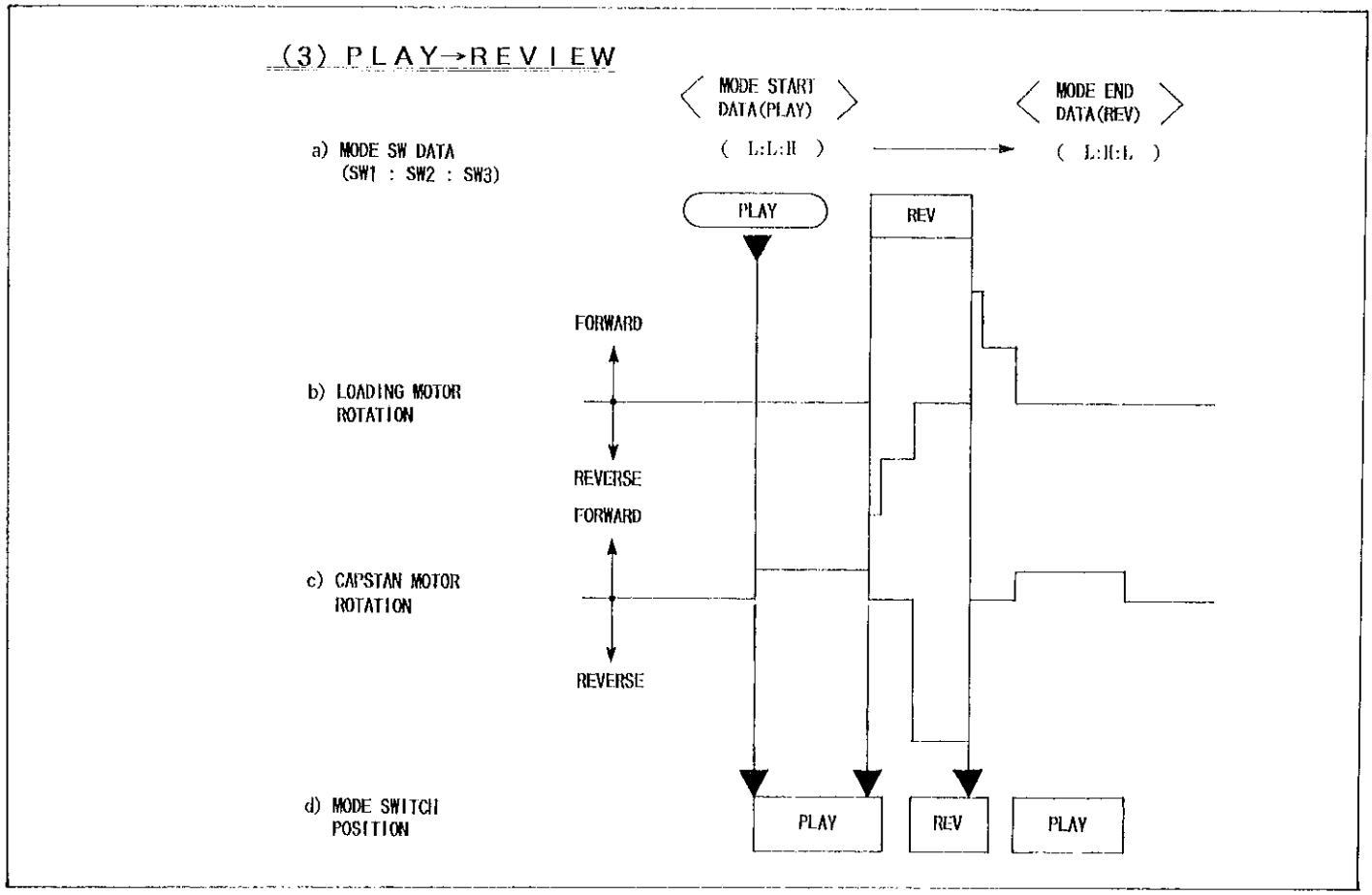


Fig. S9 Mechanical Mode Operation From PLAY TO REVIEW

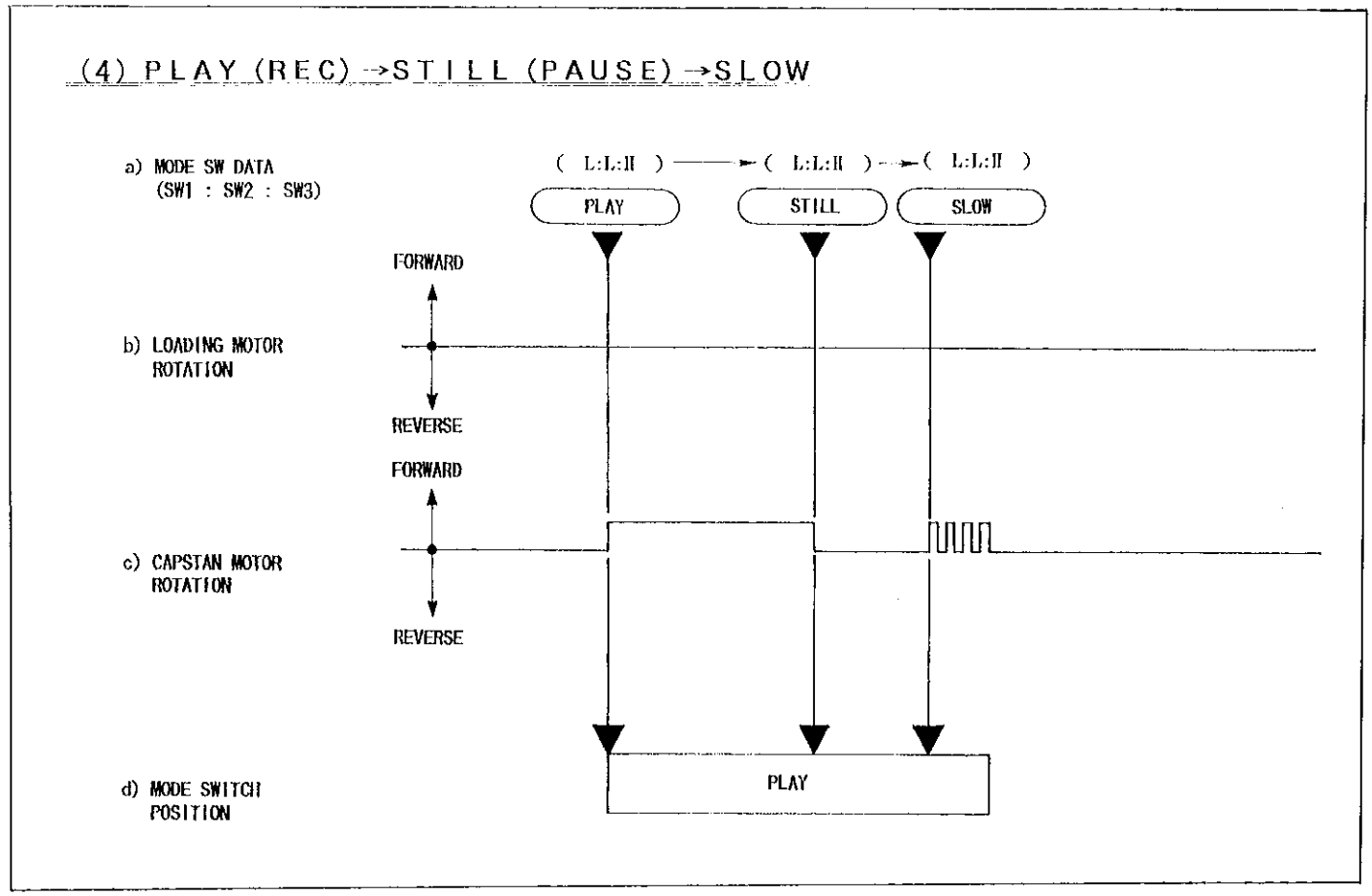


Fig. S10 Mechanical Mode Operation From PLAY TO SLOW

(5) PLAY→STOP 3→STOP

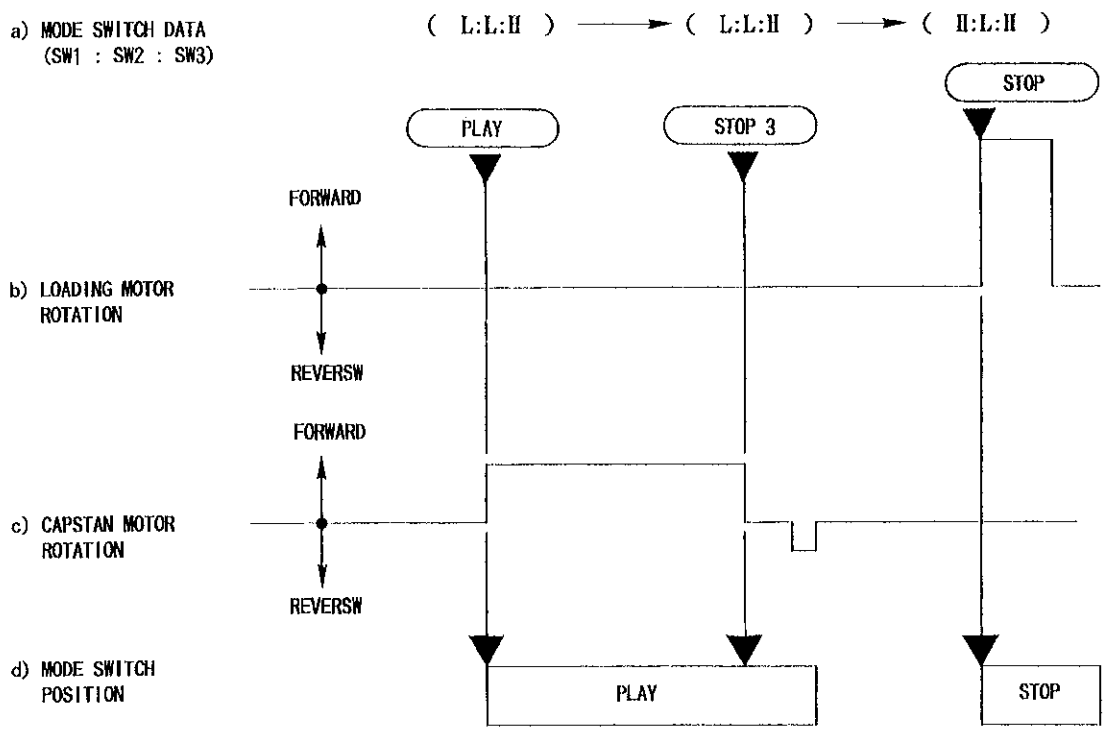


Fig. S11 Mechanical Mode Operation From PLAY TO STOP

(6) PLAY→STOP 3→FF

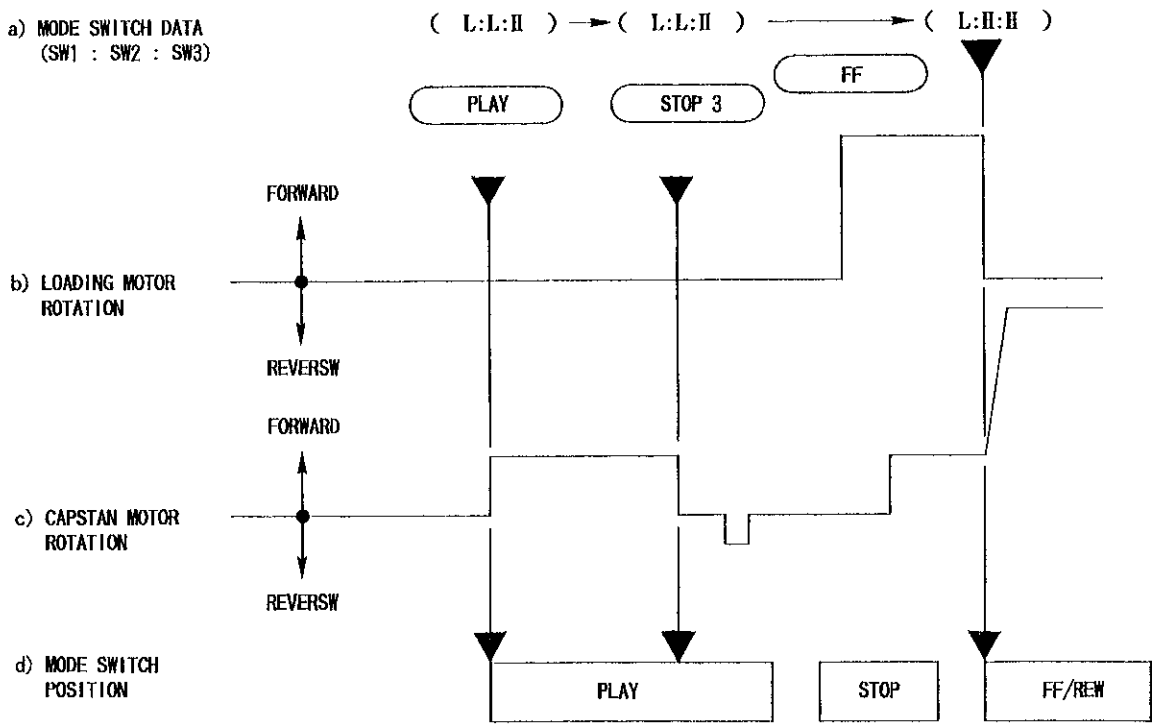


Fig. S12 Mechanical Mode Operation From PLAY TO FF

3. Serial Data/Clock Transmission Error Display

If the Serial Data/Clock is not transmitted from IC6001 to IC7501, "E9" is displayed as shown in Fig.T1. This indication will be displayed either during the Service Information Display mode or in normal mode.

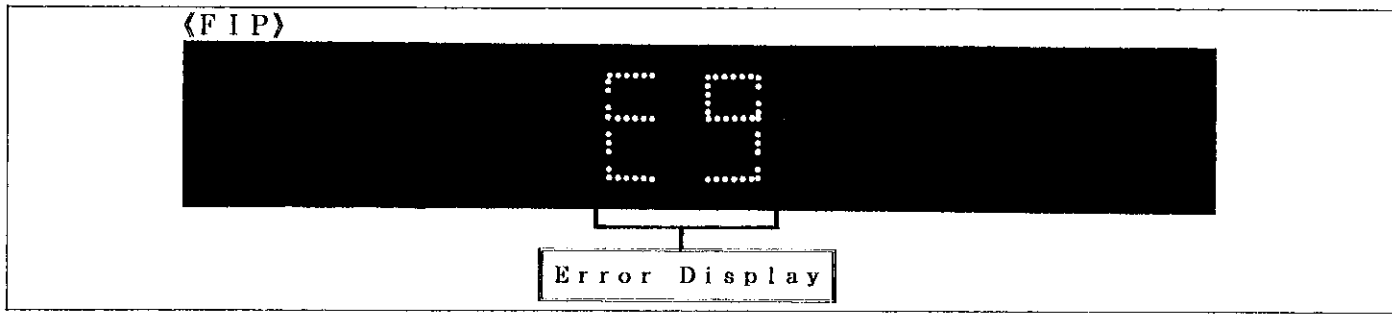


Fig. T1 Serial Data/Clock Transmission Error Display

4. Service Information Display

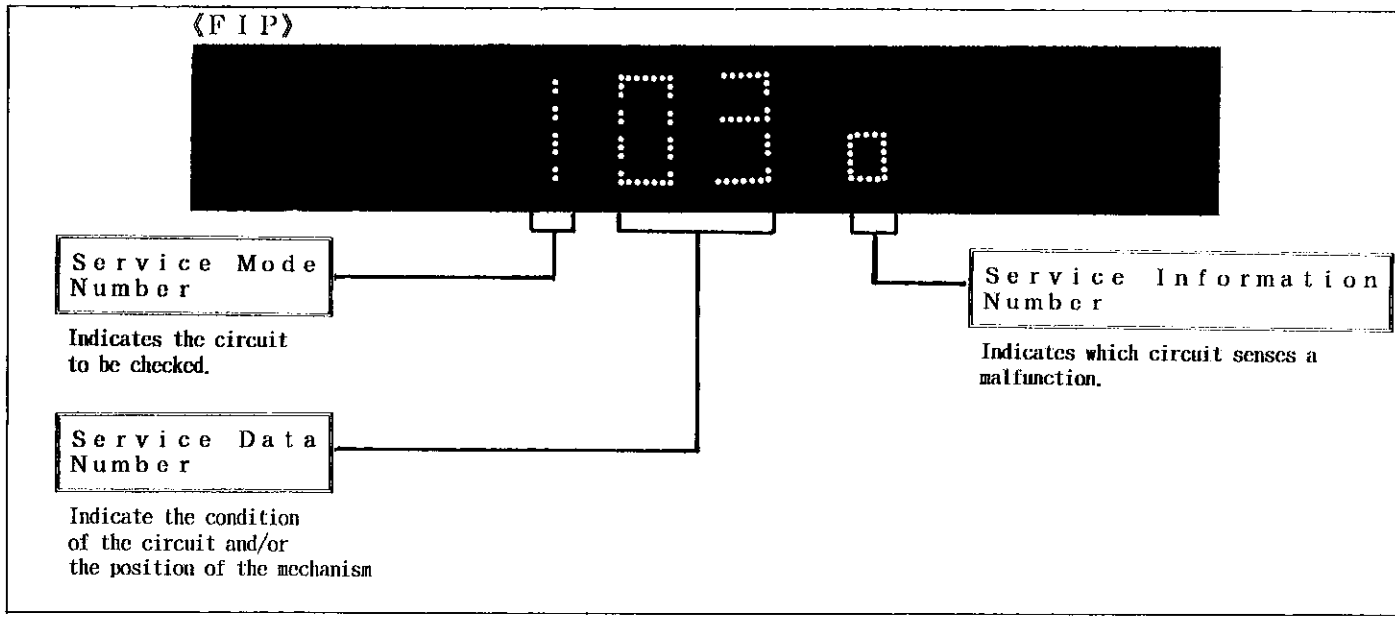

《F I P》
Service Mode Number
Indicates the circuit to be checked.
Service Information Number
Indicates which circuit senses a malfunction.
Service Data Number
Indicate the condition of the circuit and/or the position of the mechanism

Fig. D1 Service Information Display

4-1. Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by the consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

4-2. Turning on Service Information Display

There are two ways to turn on the Service Information Display.

(1) Turn the Shuttle Ring to FF then push the Eject button. The Service Information will be displayed for 1 minute.
(2) Connecting a jumper wire between TPSERV and TPGND will display the service information indefinitely.

In the Service Information Display, there are four digits divided into 3 functions.
The first digit indicates which other 6 service modes that the unit is Currently in.

MODE 1 : Check tape protection circuit
MODE 2 : Check tape transport mechanism
MODE 3 : Check mode switching operation
MODE 4 : Check control buttons
MODE 5 : Check capstan motor
MODE 6 : Check cylinder motor

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The fourth digit is the service Information display. It is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is supplied.

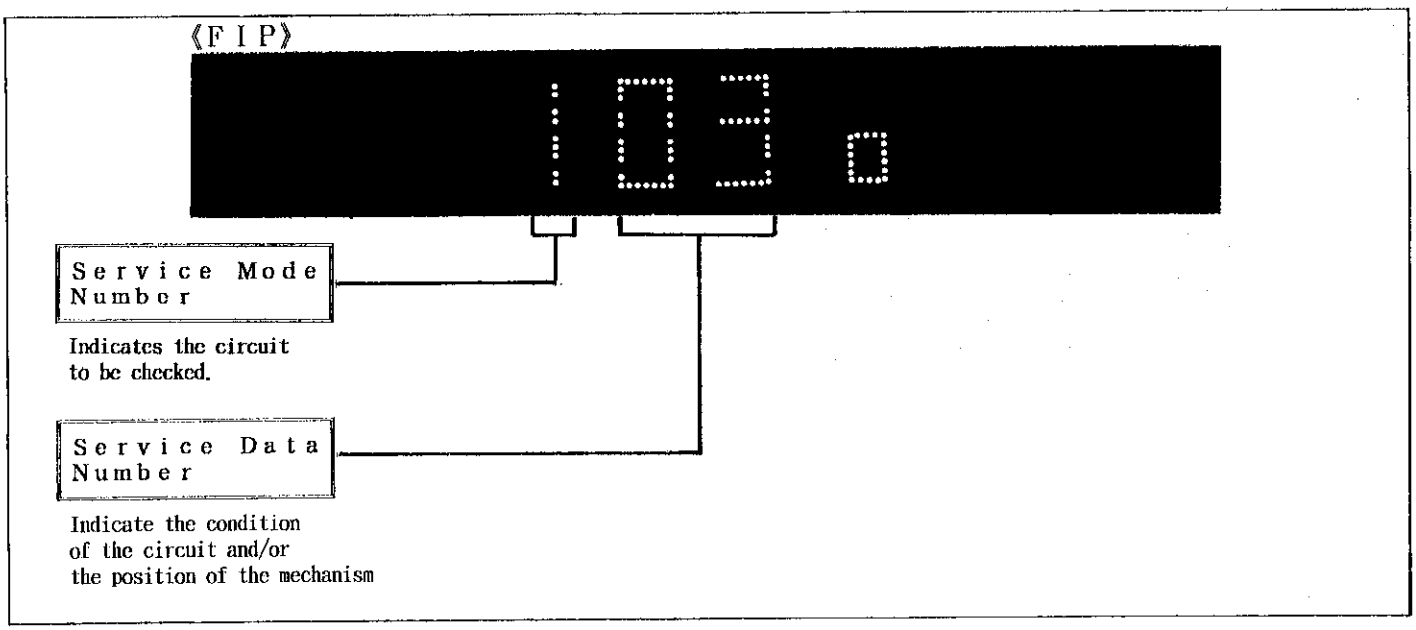

《F I P》
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicate the condition of the circuit and/or the position of the mechanism

Fig. D2 Service Mode Number and Service Data Number on S.I.D.

(1) Turn on Service Information Display.
(2) To change Service Modes turn the shuttle ring to FF then push the Eject button.
(3) Mode 1 : Checks that the Sensor LED, Supply & Take-up Sensor circuits check the circuits by blocking the light from the Sensor LED to either or both Supply & Take-up Sensors.
When the light is blocked to both sensors, "00" should be indicated on the service data number.
When the light is blocked to the supply sensor, "01" should be indicated.

(4) Mode 2 : Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.

(5) Mode 3 : Checks that mode switch circuit operations have been completed.
Service Data Number should indicate "00" after each mechanism operation is completed.

(6) Mode 4 : Checks the operation circuit.
Indicates if IC6001 receives the operating commands from the mode buttons and/or remote controller.

(7) Mode 5 : Checks the capstan motor circuit.
Indicates if the IC6001 has received the command to rotate the capstan motor.

(8) Mode 6 : Checks the cylinder motor circuit.
IC6001 has received the command to rotate the cylinder motor.

<NOTE>
Refer to Fig.D5 for details of Service Data Number.

4-4. Service Information Number

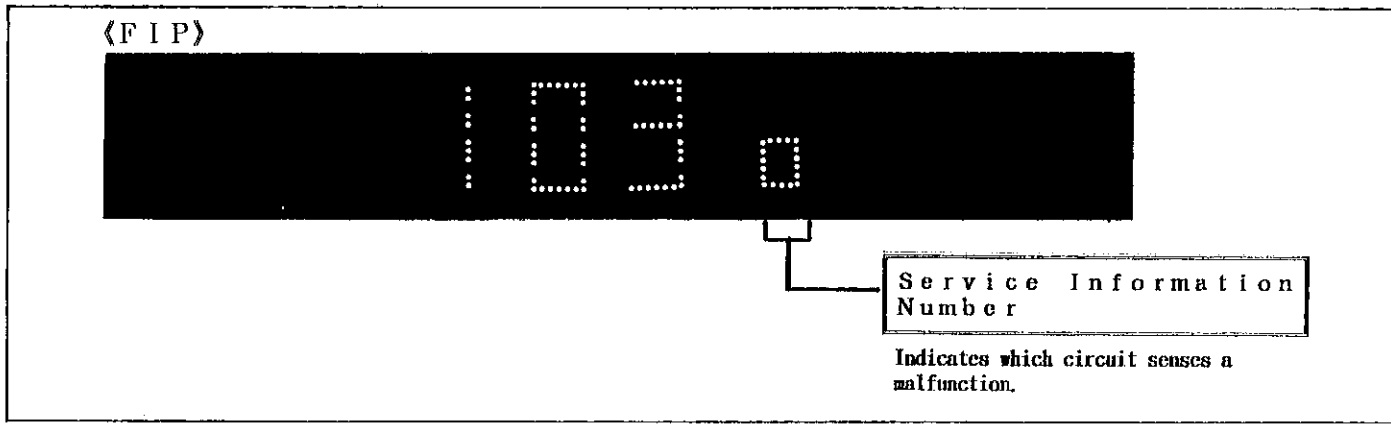


Fig. D3 Service Information Number on S.I.D.

Refer to Fig.D4 for details of Service Information Number.

Note:

The Service Information Number display is independent of the service mode display.
The Service Information Number will be stored as long as AC power is supplied.
If a second error occurs, the most current error will be displayed.

Service Information Number	Malfunction
0	Normal (No problem)
1	Cylinder stop
2	Tape reel stop
3	Stop at position other than 4 or 6
4	Stop during unloading
5	Falty capstan rotation
6	Stop during Cassette-In/Eject operation

Fig. D4 Service Information

Service mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1	———	00	No light detected at either sensor	Tape not required
		01	Tape Begining. Light to Supply Photo Sensor is blocked.	
		02	Tape End. Light to Take-up Photo Sensor is blocked.	
		03	Light detected at both sensors.	
2	———	00	EJECT	Tape Reuired *1 : STOP3 ; The Pinch Roller is on the capstan motor shaft. *2 : STOP ; The Pinch Roller is off the capstan motor shaft. Refer to Fig. D7 to Check mechanism Position and timing.
		01	Cassette-down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY/REC, STILL/PAUSE, CUE, FWD SLOW, STOP3 *1	
		05	STOP*2	
		06	FF/REW	
		07	Intermediate position	
3	Disregard service data displayed until mechanism operation is completed. Then the display should indicate "00".	00	Any display other than "00" indicates a fault in the mode switch circuit or system.	Tape Required.
4	Display only when the operating button is pressed.	Refer to Fig. D6		Tape not required.
5	Left digit only, disregard Right digit display.	Left Digit / Right Digit	8, 9, u, A, -, n, L, and no display indicate that the Capstan motor "PLAY" command recived by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.
	Right digit only, disregard left digit display.	Left Digit / Right Digit	1, 2, 3, 4, 5, 6, 7, indicate that the Capstan motor CUE, FF, Forward slow" commands received by IC6001.	
	Right digit only, disregard left digit display.	Left Digit / Right Digit	8, 9, u, A, -, n, L, and no display indicate that the Capstan motor Reverse, Rew, Reverse Slow commands received by IC6001.	
6	Left digit only, disregard Right digit display.	Left Digit / Right Digit	1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

SERVICE DATA NUMBERS	MODE BUTTONS	SERVICE DATA NUMBERS	MODE BUTTONS
3	OPERATE	54	RESET
01	EJECT	5	ZERO STOP
09	AUDIO DUB	-0	INPUT SELECT
A3	INSERT	49,4U	INDEX
-9	PAL/MESECAM	A1,A2	TRACKING(+,-)/V-LOCK
--	CHECK/PROG.	9	REPEAT
34 OR 35	∧∨, +-	8	SKIP
--	NEXT/SP/LP	--	TAPE SELECT
--	SLEEP/SHIFT	--	PROG.
A4	TIMER REC	--	NEXT
08	REC	--	RECORDING SP/LP
--	CLOCK SET	--	CANCEL
--	TUNER PRESET	10	SU(1)
80	PAUSE/STILL	11	MO(2)
0U	PLAY	12	TU(3)
00	STOP	13	WE(4)
0-,0	JOG DIAL (FRAME ADV, REVERSE ADV)	14	TH(5)
03,02	SHUTTLE RING (FF, REW)	15	FR(6)
--	TV/VTR	16	SA(7)
--	SCANNER ON/OFF	17	SU~SA(8)
--	TRANSMIT	18	MO~SA(9)
0	SEARCH	19	MO~FR(0)
8L	+ (REMOTE CONTROLLER)	3A	-/--
8	-- (REMOTE CONTROLLER)		
--	DISPLAY		

Fig. D6 Service Data Display for Service mode 4

4-5. Timing Chart from Mode SW to System control IC6001

System control IC6001 senses the mechanism position though the Mode SW.
Fig.D7 shows the timing for Service Mode Number 2.

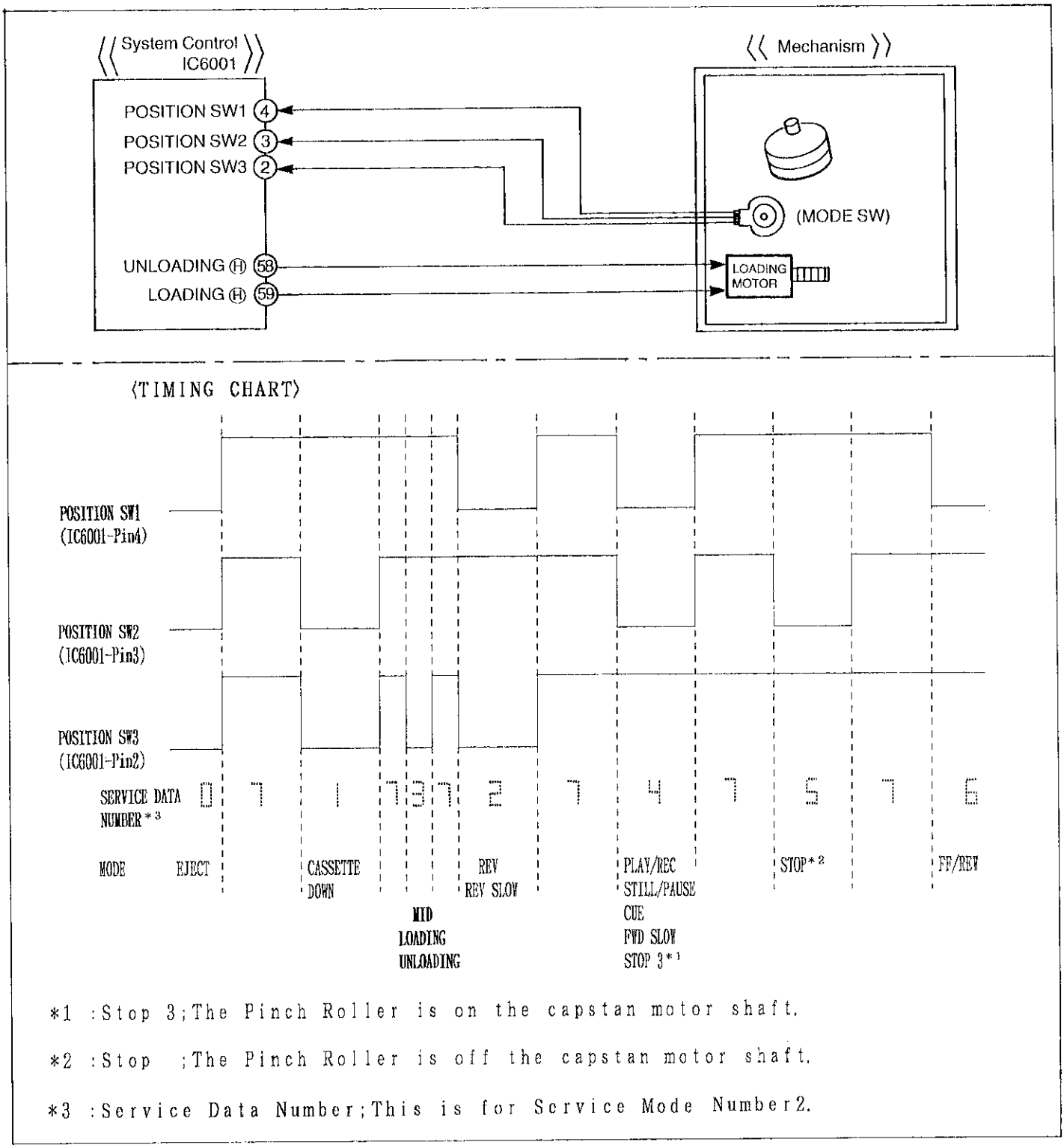


Fig. D7 Timing Chart of Mode SW

5. Parts Access Flow chart.
This chart shows the parts nessessary to gain acess to other parts.

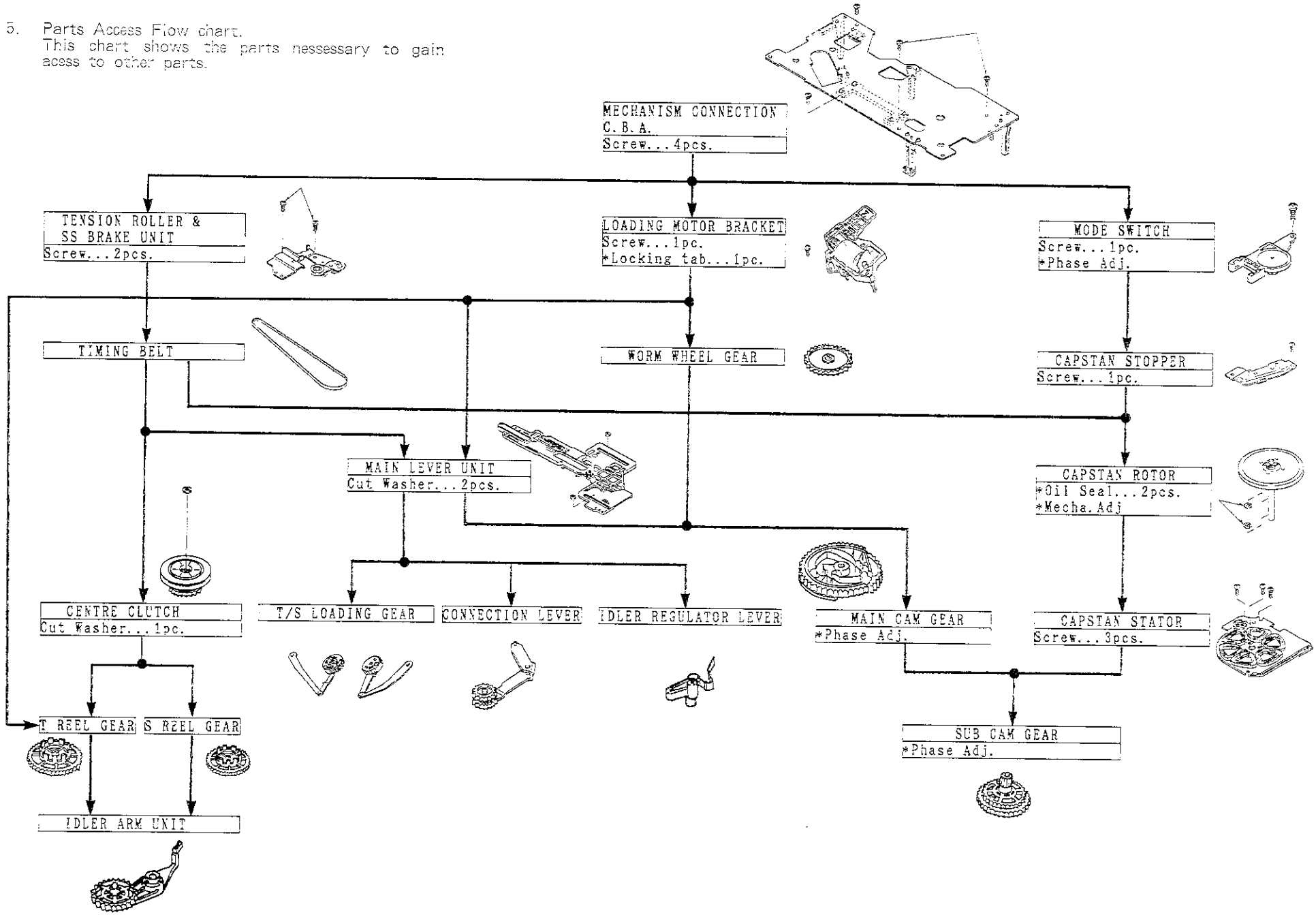
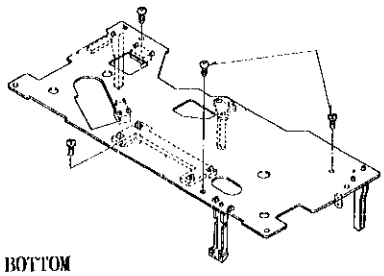
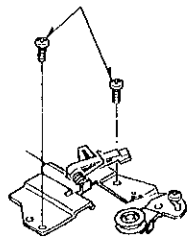
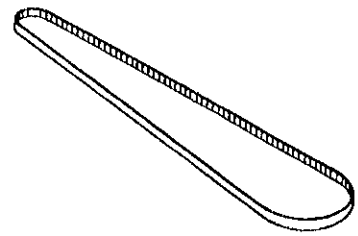
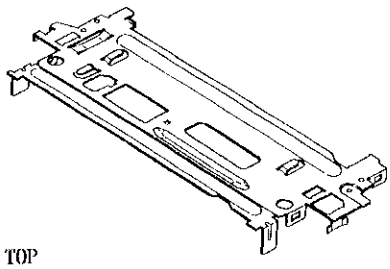
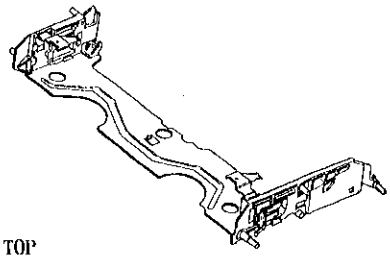
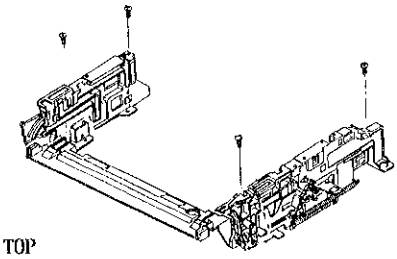
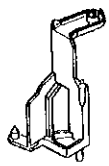
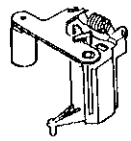
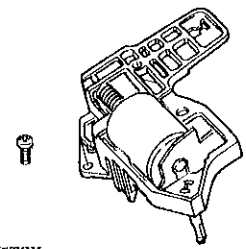
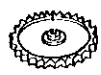
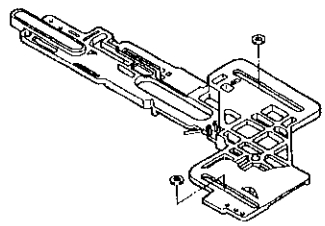
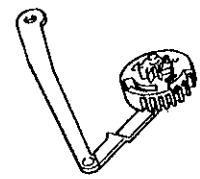
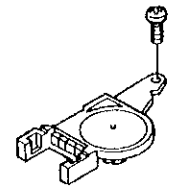
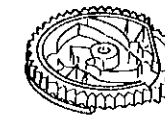
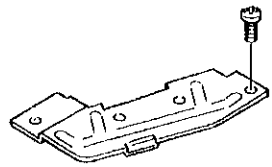
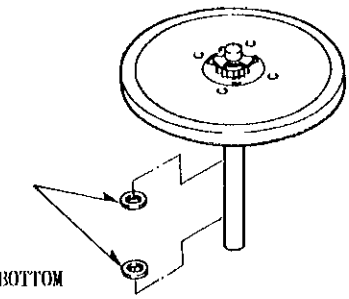
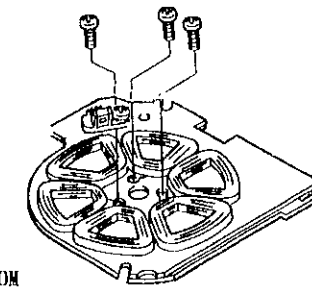
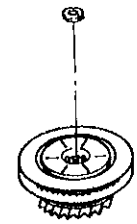
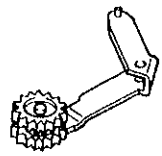
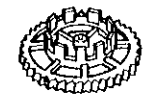
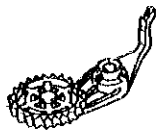
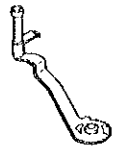


Fig. D8 Parts Access Flow Chart for Replacing.

6. Assembly/Disassembly Chart.
When disassembling this mechanism, put the parts on this table. The number indicated on each part shown the order of disassembly.

PARTS NAME	1. MACHANISM CONNECTION C. B. A.	2. TENSION ROLLER & SS BRAKE UNIT	3. TIMING BELT
PARTS & FIGURES	 BOTTOM	 BOTTOM	 BOTTOM
REMARKS			
PARTS NAME	4. TOP PLATE	5. HOLDER PLATE	6. CASSETTE HOLDER
PARTS & FIGURES	 TOP	 TOP	 TOP
REMARKS			
PARTS NAME	7. OPENER PIECE	8. PINCH ARM UNIT	9. LOADING MOTOR BRACKET
PARTS & FIGURES	 TOP	 TOP	 BOTTOM
REMARKS			
PARTS NAME	10. WORM WHEEL GEAR	11. MAIN LEVER UNIT	12. TAKE-UP LOADING ARM
PARTS & FIGURES	 BOTTOM	 BOTTOM	 BOTTOM
REMARKS			

PARTS NAME	13. SUPPLY LOADING ARM	14. MODE SWITCH	15. MAIN CAM GEAR
PARTS & FIGURES	BOTTOM	 BOTTOM	 BOTTOM
REMARKS			
PARTS NAME	16. CAPSTAN STOPPER	17. CAPSTAN ROTOR	18. CAPSTAN STATOR
PARTS & FIGURES	 BOTTOM	 BOTTOM	 BOTTOM
REMARKS			
PARTS NAME	19. SUB CAM GEAR	20. CENTER CLUTCH	21. IDLER REGULATOR LEVER
PARTS & FIGURES	BOTTOM	 BOTTOM	BOTTOM
REMARKS			
PARTS NAME	22. CONNECTION LEVER UNIT	23. TAKE-UP REEL GEAR	24. SUPPLY REEL GEAR
PARTS & FIGURES	 BOTTOM	 BOTTOM	BOTTOM
REMARKS			

PARTS NAME	25. IDLER ARM UNIT	26. P5 POST STOPPER	27. P5 STOPPER BASE
PARTS & FIGURES	 BOTTOM	TOP	TOP
REMARKS			
PARTS NAME	28. PINCH CAM GEAR	29. P5 ARM UNIT	30. TAKE-UP REEL
PARTS & FIGURES	TOP	 TOP	TOP
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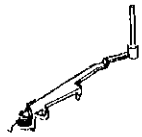
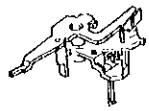
PARTS NAME	31. TAKE-UP TENSION REGULATOR ARM UNIT	32. TAKE UP BRAKE ARM UNIT	33. CARRIAGE CONNECTION GEAR
PARTS & FIGURES	 TOP	 TOP	TOP
REMARKS			